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THE

MEDICAL CHRONICLE:

A MONTHLY RECORD OF THE

Progress of Medical Science.

VOL. IX. (New Series).—APRIL TO SEPTEMBER, 1898.

JOHN HEYWOOD,
DEANSGATE AND RIDGEFIELD, MANCHESTER.
29 & 30, SHOE LANE, LONDON, E.C.

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THE MEDICAL CHRONICLE:

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THE NEW BRITISH PHARMACOPŒIA.

By D. J. LEECH, M.D. (Lond.), F.R.C.P., D.Sc. (Vict.),

Physician, Manchester Royal Infirmary; Professor of Materia Medica and Therapeutics, The Owens College.

BEFORE giving an account of the British Pharmacopœia for 1898, and pointing out the difference between it and the previous pharmacopœia, it may be well to say a few words as to its genesis.

In accordance with an Act passed in 1862, the Medical Council in 1864 issued the first pharmacopœia, in which were fused the three pharmacopœias of London, Edinburgh, and Dublin, which had previously been separately produced. Although a vast amount of trouble had been spent by very able men in effecting the fusion, the book itself was not perfectly satisfactory, and in 1867 a new pharmacopœia appeared, in which, for the first time, the alphabetical arrangement was adopted, and a departure of great importance was made, for the metric system was allowed as an alternative in volumetric estimation. An addendum was published in 1874, and eleven years later the pharmacopœia of 1885 was issued, edited by Professors Redwood, Bentley, and Attfield. It differed from that of 1867 in that 20 drugs and preparations previously official no longer appeared, whilst 116 were introduced. Many changes were made in the description of drugs, in the tests for their purity, and in chemical nomenclature.

In 1890 an addendum to the pharmacopœia of 1885 appeared, which made official 45 new substances, in addition to those previously introduced.

When, in December, 1893, it was decided that another edition of the pharmacopœia was required, it became necessary to determine the nature and the amount of the changes it was desirable to make.

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The propriety of attempting to render it more useful to the colonies and dependencies than it had hitherto been was generally acknowledged, but on other points very diverse views existed. Some, notably Sir Richard Quain, considered but little further change was needed than to add some of the approved new remedies and excise a few of those which had become less used. But the letters and articles which appeared in the medical papers as soon as it became known that a new pharmacopœia was contemplated showed there was a widespread feeling that something more than this was required. Those who were compelled to make the pharmacopœia the basis for their teaching, the lecturers on Materia Medica at the various schools, were among the most adverse critics of the pharmacopœia, and pointed out its shortcomings and many errors, and chemists, botanists, and pharmacists were no less insistent in calling for a thorough revision of all parts of the work. Eventually arrangements were made for such revision. The various colleges and universities and the pharmaceutical society were asked to send in reports on the requirements of a new pharmacopœia, as they had done in 1885; and Dr. Attfield was again appointed editor. But, in addition, referees in botany, chemistry, and pharmacology were appointed, and Dr. Tirard was made Medical Secretary. In due time a large mass of suggestions was presented by the various bodies applied to, and also by colonial authorities who had been approached through the Privy Council. But information and suggestions were also offered by other bodies and by private individuals. Amongst the most important of such contributions was the memorandum of the Therapeutic Committee of the British Medical Association. In this the nature of the changes which were called for in a new pharmacopœia was indicated, and the result of an enquiry made concerning the frequency with which certain drugs were used by members of the British Medical Association was set forth. Mr. Martindale published an analysis of 12,000 prescriptions dispensed in London, Aberdeen, Carlisle, Cork, and Oxford, showing the frequency with which the various drugs are ordered, and the Council was supplied by the Editor with an epitome of contributions to the progress of pharmacy since 1885.

With the information thus collected the work of revision was commenced. The Committee of the Pharmaceutical Society was good enough to undertake the revision of the various pharmaceutical processes and the description of the drugs. Dr. Attfield, besides collating the information sent in and performing the ordinary editorial duties, undertook the revision of the pharmaceutical chemistry of the work, whilst from time to time questions were submitted to the referees on which the opinion of experts was required. The work of the Pharmacopœia Committee of the General Medical Council was to determine the

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nature of the changes required, and reconcile the sometimes discordant recommendations of the various bodies consulted, and to supervise the work during its progress.

The Pharmacopœia of 1898 is the outcome of the work carried on by the agencies I have alluded to during the past four years. Although it does not differ greatly in form from that of 1885, it will be found to have undergone many changes, and I propose to consider these changes under the following headings :—Omissions, additions, changes in mode of preparation, changes in tests and descriptions, changes in nomenclature, alterations in doses and strength, and changes in weights and measures.

OMISSIONS.

It is no easy task to decide on the drugs and preparations which should cease to appear in a pharmacopœia, for there appears a very wide difference of opinion as to the value of almost every official drug. This was illustrated by the plebiscite with regard to the use of a series of those thought by the Therapeutic Committee to be least important. Out of 12,000 members of the Medical Association only about 6,000 took the trouble to reply to the circular issued by the committee asking the members to state whether they used these drugs frequently, occasionally, or not at all, and the results obtained from the inquiries were somewhat unexpected. Although most medical men had the impression that the Pharmacopœia of 1885 contained many drugs which had quite gone out of use, there was hardly a single drug or preparation which some medical man did not return as much used. Even elemi was reported as frequently used by 20 and rarely by 155, whilst the ointment of elemi appeared as frequently used by 78 and rarely by 348.

It was subsequently found, however, that a considerable number of the answers had been hurriedly made and were inexact. Liquor chlori (as prepared in the Pharmacopœia) was reported as frequently used by 114, and often used by 619. But when letters were sent to some of those gentlemen who had returned it as frequently used by them, asking the particulars of its employment, it was found that in every case an error had been made in the report; either some other preparation containing chlorine had been used, or the indication of frequent use had been made by mistake. So, too, with regard to the extract of aconite; when further enquiries were made, more than 40 per cent of those who had reported they used the drug said they had made the statement by mistake, or had employed not the extract, but some other preparation of aconite, and even frequency of use did not always indicate a belief in utility. In one case in which the extract had been returned as frequently used, the reporter said he found ½ lb, of aconite extract in his surgery when he bought the practice

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and had used it up, but never intended to employ it again. The results which were obtained by the Therapeutic Committee had less value than if more care had been employed in making the returns. Nevertheless they did furnish a rough basis for judgment with regard to the frequency with which drugs are used. The tables sent to the Medical Council by the Pharmaceutical Society and Mr. Martindale, relating to the frequency with which drugs appear in prescriptions, furnished additional knowledge bearing on the omissions which were called for, and the Pharmacopœia Committee were much aided in deciding the omissions by the recommendations made by the Universities and the diploma-giving bodies.

It has been decided to exclude the following drugs and preparations:—

TRANSFERRED TO APPENDIX BECAUSE USED AS TESTS.

Alcohol Amylicum.
Bromum.
Calcii Sulphas.
Cuprum.
Liquor Chlori.
Manganesii Ox. Nigrum.
Mucilago Amyli.
Potassii Ferrocyanidum.
Soda Caustica.
Zincum.
Zincum Granulatum.

ALTOGETHER OMITTED.

Acetum.
Acidum Lacticum Dilutum.
„ Meconicum.
Aconiti Folia.
Ammonii Nitras.
Anisi Stellati Fructus.
Aqua.
Argentum Purificatum.
Aurantii Fructus.
Beberinæ Sulphas.
Belæ Fructus.
Bismuthi Citras.
„ et Ammonii Citras.
Bismuthum.
Bismuthum Purificatum.
Calamina Præparata.
Canellæ Cortex.
Carbo Animalis.
„ Animalis Purificatus.
Cataplasma Carbonis.
„ Conii.
„ Fermenti.
„ Lini.
„ Sinapis.
Cataplasma Sodæ Chlorinatæ.
Cerevisiæ Fermentum.
Cetraria.
Charta Epispastica.
Cinchonæ Cortex.
Cinchonidinæ Sulphas.
Cinchoninæ „
Confectio Opii.
„ Rosæ Caninæ.
„ Scammonii.
„ Terebinthinæ.
Creta.
Cupri Nitras.
Decoctum Cetrariæ.
„ Cinchonæ.
„ Hordei.
„ Papaveris.
„ Pareiræ.
„ Quercûs.
„ Sarsæ.
„ Sarsæ Compositum.
„ Taraxaci.
Ecballii Fructus.
Elemi.

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Emplastrum Ferri.
„ Galbani.
„ Saponis Fuscum.
Enema Aloes.
„ Asafœtidæ.
„ Magnesii Sulphatis.
„ Opii.
„ Terebinthinæ.
Essentia Menthæ Piperitæ.
Extractum Aconiti.
„ Aloes Socotrinæ.
„ Belæ Liquidum.
„ Calumbæ.
„ Colchici Aceticum.
„ Conii.
„ Gelsemii Alcoholicum.
„ Hæmatoxyli.
„ Jaborandi.
„ Lactucæ.
„ Lupuli.
„ Mezerei Æthereum.
„ Papaveris.
„ Pareiræ.
„ Quassiæ.
„ Rhamni Frangulæ.
„ Rhamni Frang. Liq.
Farina Tritici.
Ferri Peroxidum Hydratum.
„ Sulphas Granulata.
Glycerinum Acidi Gallici.
Gutta Percha.
Hordeum Decorticatum.
Hydrargyri Persulphas.
Infusum Anthemidis.
„ Catechu.
„ Cusso.
„ Jaborandi.
„ Lini.
„ Maticæ.
„ Valerianæ.
Kamala.
Lac.
Lactuca.
Laricis Cortex.
Liquor Ammonii Acetatis Fortior.
„ „ Citratis „
Liquor Antimonii Chloridi.
„ Calcii „
„ Ferri Acetatis Fortior.
„ „ Dialysatus.
„ Gutta Percha.
„ Iodi.
„ Lithiæ Effervescens.
„ Magnesii Citratis.
„ Morphinæ Bimeconatis.
„ „ Sulphatis.
„ Potassæ Effervescens.
„ Sodæ.
„ Sodæ Effervescens.
Manna.
Marmor Album.
Mastiche.
Maticæ Folia.
Mel.
Mica Panis.
Mistura Ferri Aromatica.
„ Scammonii.
Mori Succus.
Morphinæ Sulphas.
Nectandræ Cortex.
Oleatum Zinci.
Oleo-resina Cubeba.
Oleum Myristicæ Expressum.
„ Rutæ.
„ Sabinæ.
Os Ustum.
Ovi Albumen.
Ovi Vitellus.
Pilula Conii Composita.
„ Ferri Carbonatis.
„ „ Iodidi.
Plumbi Nitras.
Potassii Cyanidum.
Quercûs Cortex.
Rhamni Frangulæ Cortex.
Rosæ Caninæ Fructus.
„ Centifoliæ Petala.
Sabadilla.
Sabinæ Cacumina.
Santonica.
Sodii Nitras.
„ Valerianas.

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Spiritus Tenuior.
Suppositoria Acidi Tannici cum Sapone.
„ Hydrargyri.
„ Morphinæ cum Sapone.
Syrupus Ferri Subchloridi.
„ Mori.
„ Papaveris.
Tabaci Folia.
Theriaca.
Tinctura Chloroformi Composita.
„ Ergotæ.
„ Ferri Acetatis.
„ Gallæ.
„ Laricis.
„ Lobeliæ.
„ Sabinæ.
„ Valerianæ.
„ Veratri Viridis.
„ Zingiberis Fortior.
Trochisci Opii.
Unguentum Antimonii Tartarati.
„ Calaminæ.
„ Elemi.
„ Potassæ Sulphuratæ.
„ Sabinæ.
„ Simplex.
„ Terebinthinæ.
Uvæ.
Vapor Acidi Hydrocyanici.
„ Chlori.
„ Coninæ.
„ Creasoti.
„ Iodi.
„ Olei Pini Sylvestris.
Veratri Viridis Rhizoma.
Vinum Aloes.
„ Opii.
„ Rhei.

OMITTED BUT REPLACED BY OTHER PREPARATIONS DIFFERING TO SOME EXTENT IN NAME AND COMPOSITION.

Former Name.	*Present Name.*
Aurantii Cortex.	Aurantii Cortex Recens.
	„ „ Siccatus.
Decoctum Scoparii.	Infusum Scoparii.
Essentia Anisi.	Spiritus Anisi.
Ergotinum.	Extractum Ergotæ.
Linimentum Iodi.	Liquor Iodi Fortis.
Oleatum Hydrargyri.	Hydrargyri Oleas.
Oleum Pini Sylvestris.	Oleum Pini.
Physostigmina.	Physostigminæ Sulphas.
Pilula Asafœtidæ Composita.	Pilula Galbani Composita.
Suppositoria Acidi Carbolici cum Sapone	Suppositoria Acidi Carbolici.
Tinct. Ergotæ.	Tinct. Ergotæ Ammoniata.
Unguent. Oleati Zinci.	Unguent. Zinci Oleatis.

In early times foods entered largely into the Materia Medica, and the older pharmacopœias contained a considerable number of dietetic substances, either as remedies or as vehicles for remedies. In the pharmacopœia of 1885 many of these still had place—as, for example, pearl barley, and barley tea, linseed tea, Irish moss, the green lettuce, flour, bread, milk, treacle, and vinegar. These have disappeared, and with them have gone most of the domestic remedies, such as poppyhead fomentation, chamomile tea, barm and its poultice, oak bark and its decoction, manna, dandelion tea, etc.

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The pharmacopœia was also burdened with many substances once in vogue, the popularity of which has waned—as, for example, bael fruit, canella, animal charcoal, frangula bark, larch bark, mastich, green hellebore, tobacco, savine, rue, kamala, matico, and bromine. These are no longer official, nor are the substitutes for quinine, such as cinchonine, cinchonidine, and berberine, which are not required, since quinine is now so cheap. Many of the chemical substances omitted fall out, because it has been decided not to set forth the exact mode of preparation of drugs and chemicals which are usually made commercially on a large scale. Hence it is that such substances as amyl alcohol, ferrocyanide of potassium, sulphate of lime, copper, zinc, bismuth, and silver no longer appear official, though several of them appear in the appendix as tests.

It has not been considered necessary further to include in the official drugs many of those substances from which drugs are obtained, especially where such drugs have distinct characters and can be easily tested—as, for example, the star anise fruit, sabadilla, santonica, creta, etc. The derivatives of these substances, oil of anise, veratrine, santonine, and prepared chalk are alone made official and tests for their purity fully given.

For various reasons a large number of the preparations of drugs disappear from the Pharmacopœia.

The poultices, enemata, and vapours have gone out, because the Pharmacopœia is not issued for the purpose of indicating the methods in which drugs may be employed.

The increase in bulk of the two last pharmacopœias has been largely due to the fact that new preparations of various drugs and chemical substances have been added without the older and less used ones being removed. A beginning has now been made in decreasing the number of preparations of individual drugs. Two of the preparations of bismuth and seven of iron disappear. The citrates of bismuth and ammonia were rarely used. It is true that 118 out of about 6,000 practitioners stated they used the citrate frequently, whilst 237 reported the frequent use of the ammonia salt, but in the case of bismuth preparations, especially, there is reason to believe that many errors were made in making the returns as to frequency of use. Of the seven iron preparations omitted, the peroxide, once very popular, has been for the most part superseded by other preparations; the granulated sulphate was merely a convenient dispensing form; the iodide of iron in the pill form was unstable, and with the introduction of a pill of iron, the necessity for a carbonate of iron pill ceased; three forms of the acetate were surely not required considering the infrequency of the use of the acetate. The only preparation which will be missed, probably, is liquor ferri dialysatus; this, however, is a preparation which very easily decomposes.

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Three preparations of opium and three of morphine have been removed from the official list. The confection and wine of opium were relics of the early days of pharmacy, whilst the lozenge is hardly needed now that we have a morphine lozenge. The morphine salts and solutions have gradually increased in number in recent years, though there is probably no difference in their mode of action. It has been thought right to omit the bimeconate and the sulphate, which have not been proved to be better than other salts.

Of the sodium preparations omitted the caustic soda and the solution of soda have long ceased to be used in medicine, their place being taken by the corresponding potash preparations. Soda water seemed hardly worthy of recognition, the nitrate was used for manufacturing purposes only, and the valerianate was hardly used at all.

Nitrate of copper has not been shown to have any special advantage over the sulphate, and nitrate of lead is little used.

Calamine, which is usually described as a native oxide of zinc tinged with iron, turns out to be almost entirely at the present time a purely artificial preparation; it is, in fact, an oxide or carbonate of zinc coloured in various ways. There appeared only two courses, either to introduce an artificially coloured oxide of zinc or to omit calamine altogether, and the latter course has been adopted.

Turning to the various forms of preparations it will be noted that one acid, dilute lactic, is amongst the omissions. The strength of dilute lactic acid has to be varied according to the purpose for which it is used, and it is more convenient and easy to dilute to the strength required.

Three of the plasters have disappeared—viz., plasters of iron, galbanum, and brown soap. The two latter will be missed by none. The iron plaster was an antiquated form, probably introduced with some idea that the iron might have a strengthening effect. The pitch plaster, which is still retained, will answer every purpose served by the iron plaster.

The word essence, which savours of old-time medicine, now disappears from the Pharmacopœia, it is to be hoped for ever, for both the essences of the 1885 edition are excluded. The essence of aniseed, which contains one part of oil and five of rectified spirit, is replaced by a spirit which contains one in ten, whilst the essence of peppermint, which also contained one part of oil and five of rectified spirit, is replaced by a spirit having a strength of one in ten, the old spirit of peppermint of the strength of one in fifty being omitted. This change is in accordance with common usage. As a fact the one in five essence was rarely used. What was called essence of peppermint was usually the one in ten preparation, and the weaker spirit was rarely ordered.

The extracts have been reduced from 35 to 22. Extract of aconite,

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as above noticed, was found to be really little used. Conium extract is undoubtedly more often employed than aconite. Out of 6,000 who replied to the circular of the Therapeutic Committee, 354 reported they used it frequently, and 1,399 rarely. But, as in the case of aconite, further inquiries have shown that it is much less used than would appear from these numbers. The mode of preparation of the extract renders it a very unsatisfactory substance, and it has not seemed possible to devise a better plan of making it. Socotrine aloes proves to be a somewhat uncertain substance, and it seemed hardly necessary to have two aloes extracts; nor does it seem there is any call for so many bitter extracts, which are chiefly used as excipients for pills. Hence gentian alone has been retained, while quassia, calumba, and hops are omitted. The acetic extract of colchicum was introduced on the supposition that acetic acid dissolves the active principles of the drug more readily than water. This is not so. The ordinary extract is a perfectly efficient preparation. Gelsemium, logwood, and jaborandi are rarely used extracts, other preparations of these drugs being usually preferred. Extract of pareira is a most uncertain preparation, and to be of any value must be given in large doses. Ten to thirty grains is the pharmacopœial dose, but not many will take so large an amount in pill form, and it was of no use for other purposes.

The infusions have not been curtailed as much as the decoctions, but seven are omitted. The infusions of catechu, jaborandi, and valerian are the least certain preparations of these drugs. Infusion of cusso is hardly a preparation for the pharmacopœia, since the water is simply used for the purpose of enabling the drug to be swallowed.

Of the liquors, the weaker solutions of acetate and citrate of ammonia have alone been retained, whilst the solution of calcium chloride disappears, because it was simply a solution of salt in water. Two solutions of acetate of iron are not required, and the least stable one, the tincture, has been left out. Solution of guttapercha is no longer used in making charta sinapis, and therefore disappears. Solution of iodine is not needed, the tincture serving all its purposes; and effervescent solutions of potash, soda, and magnesia seemed hardly worthy of a place in the Pharmacopœia. Solution of chlorine is quite unsuitable for use as a medicine because it is so unstable.

Two mixtures disappear—mistura ferri aromatica (Heberden's ink) and mistura scammonii. The retention of the first-named mixture for so many years can only have been due to the feeling of respect entertained for the great English physician; for it was unchemical and unsightly, and but little used. The mistura scammonii disappears because it was only used frequently by 32 out of 6,000. The fact that 117 out of 6,000 used oleo-resina cubeba has not prevented its exclu-

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sion. It is probable that some other preparation of cubebs was meant by the majority of those who stated they used the oleo-resina. Rue oil had few supporters, only 28 out of 6,000 employing it frequently; and savine oil is only a popular emmenagogue, and deserves no place in the Pharmacopœia; hence both these oils disappear.

The syrups have been gently dealt with, only three in the pharmacopœia of 1885 being absent from that of 1898. Mulberry syrup is one of those preparations which has gradually gone out of general use. It was found that it was employed often by only 198 practitioners out of 6,000. The syrup of subchloride of iron, though comparatively recently introduced, has not been sufficiently employed to render it necessary to keep it as an official preparation. The retention of syrupus papaveris could only be defended on the ground that it is a mild opiate for children. There is evidence that morphine is sometimes contained in poppyheads, but it is not always there, and it is not possible to standardise the syrup. A preparation of opium which is not uniformly of the same strength, and cannot be standardised, is manifestly unfit for medicinal treatment, especially of children.

The tinctures are not largely diminished. The compound tincture of chloroform is nothing more than a mixture of three official substances—tincture of cardamoms, chloroform, and rectified spirit. It does not seem necessary to make such a simple mixture official; the proportion, moreover, of the ingredients was unsatisfactory, there being in it too large an amount of chloroform. Tincture of ergot was a bad preparation of this drug. Tinctures of lobelia and valerian have been omitted because there are similar preparations which are more used, viz., the ethereal and ammoniated tinctures of these two drugs. Tincture of galls, savine, acetate of iron, and veratrum viride are so rarely employed that it has not been thought necessary to retain them; nor has it been deemed desirable to keep in the Pharmacopœia two tinctures of ginger.

The lozenges, like the syrups, are not decreased in number; only one, that of opium, being omitted, whilst several are added.

Of the ointments, the barbarous tartar emetic ointment is finally disposed of, and the ointment of sulphurated potash and turpentine have been found to be so little used that they are no longer required.

Two omissions deserve special notice—viz., water and proof spirit. In the pharmacopœia of 1885 water was official, but was somewhat absurdly defined. But in the present Pharmacopœia, whenever water is used, distilled water is specified, except, indeed, in those cases in which distillation is employed in producing preparations, as in some aquæ. Practically, therefore, distilled water is used in all the preparations of the Pharmacopœia. It may be pointed out that the stringency of the purity tests for distilled water has been gradually increased, for it

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has been found that distilled water is not infrequently impure, being derived from waste steam.

Proof spirit should, perhaps, hardly be counted among the omissions. It no longer, indeed, appears under this name in the Pharmacopœia, but instead several dilutions of alcohol have been introduced. The old proof spirit contained 57 per cent by volume of alcohol. The new dilutions contain respectively 20, 45, 60, and 70 per cent.

The last group of substances omitted—viz., those which have been replaced by other preparations, differing more or less in name and character—require but little notice.

It has been found that there is no advantage in boiling broom tops; hence, an infusion is now official instead of the old decoction. Oleatum hydrargyri becomes hydrargyri oleas; but whereas the old preparation was made by dissolving yellow oxide of mercury in oleic acid, the new oleate is made by the interaction of mercuric chloride, soap, and oleic acid.

In the pharmacopœia of 1885 the misleading name of "ergotinum" was given to the purified extract of ergot. The preparation was, of course, in no sense allied to an alkaloid; nor was it a neutral principle. It is replaced in the Pharmacopœia of 1898 by extractum ergotae, which has been found to be an excellent preparation. The subcutaneous injection of ergot has now to be made with this extract.

Linimentum iodi of the 1885 pharmacopœia did not conform in nature with the other official liniments. It has been altered in composition, the glycerine which it contained being advantageously withdrawn, and the iodide of potassium lessened in amount. It is now simply a strong solution of iodine, and this is indicated by its new name, liquor iodi fortis.

With regard to the oleum pini sylvestris it has been found that the pine oil used was not usually obtained from the pinus sylvestris. Hence, the oil from the pinus pumilio has been substituted.

Sulphate of physostigmine is more soluble than physostigmine, which it replaces.

The compound asafœtida pill is slightly altered, and the name is changed to compound galbanum pill. It is the only preparation containing galbanum in the pharmacopœia, and as the word asafœtida is often recognised and objected to by patients, it has been thought desirable to sink it in the official name.

The carbolic acid suppository loses the soap which made it difficult of solution in the bowel.

Tincture of ergot has been replaced by a much better preparation—the ammoniated tincture.

Doubtless there will be many who will regret and perhaps find fault

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with the omission of some of the drugs which are now excluded from the Pharmacopœia, but it must be borne in mind that the omission of a drug in no way prevents its being obtained and used. It merely indicates that it has not been thought by the Medical Council of such value that tests of its purity should be given.

On the other hand there will be probably many more who will complain that so many seemingly useless drugs and preparations are still retained, and who will ask why saffron, musk, cochineal, hemidismus, and the like are still official. I can only say that all have been considered, and, from reasons adduced, the majority of the Pharmacopœia Committee have thought well that for the present, at least, it should be so. Whether these reasons will be considered satisfactory to the majority of medical practitioners I do not know; some of them, not at first sight clear, may be explained. I will only allude to one or two. Saffron seems a useless substance. It is not known to have any medicinal effect, and it is, moreover, an expensive drug. It has been excluded from the ammoniated tincture of opium, and from aromatic chalk powder, but it still enters into the compound decoction of aloes, and the tincture of saffron. Now apart from the fact that tincture of saffron is employed as a colouring agent it was found that the presence of saffron does improve the taste of decoction of aloes. At least, the pharmacists did not seem able to prepare an aloes compound like the decoction without saffron, which was so pleasant as to take the place of a decoction containing saffron; therefore, saffron is still official.

The infusions, again, are doubtless very bad preparations; but whilst they are so much ordered it did not seem desirable to abolish them. The Pharmacopœia cannot altogether lead medical opinion; it must, to a considerable extent, be adapted to the custom of the profession.

Besides excluding a large number of drugs and preparations, the method of preparation which was formerly given in the case of a large number of chemical substances is now omitted. It is well known that the methods of production formerly described have not been usually adopted by manufacturing chemists in preparing these compounds on a large scale. In order to conform to the Act of Parliament, however, the general statement is given under the head of each drug as to the method in which it may be produced. But details are only set forth where they are likely to be of service. Certain chemical compounds, for example, are made by pharmacists; others vary somewhat in physical properties, according to the exact way in which they are made, and some cannot be fully tested. In these cases the method of preparation is given. Thus, for example, full details are given of the preparation of arsenate and phosphate of iron, saccharated carbonate of iron, ammoniated mercury, iodide of mercury and arsenic, veratrine, etc.

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Another omission must be noticed. In the pharmacopœia of 1885 a list of all the preparations which each substance entered into was set forth at the bottom of the paragraph describing them. Some of these lists were quite useless, many were of value. It has been thought desirable to cease setting forth these lists in the body of the pharmacopœia, and give those which were of value in the index. If it be desired to know the names of the various preparations of a drug and of the preparation into which it enters, it is only necessary to turn to the English name of the drug in the index.

ADDITIONS.

Whilst the omissions have been numerous, as compared with those made in various pharmacopœias, the additions have not been many; for only 80 new drugs and preparations will be found in the Pharmacopœia of 1898 for the first time.

ARTICLES AND PREPARATIONS INCLUDED IN THE BRITISH PHARMACOPŒIA OF 1898, WHICH WERE NOT IN THAT OF 1885, NOR IN THE "ADDITIONS" OF 1890.

Araroba.
Benzol.
Bismuthi Salicylas.
Caffeinæ Citras Effervescens.
Caoutchouc.
Carbonis Bisulphidum.
Cocaina.
Codeinæ Phosphas.
Extractum Belladonnæ Liquidum.
„ Ipecacuanhæ Liquidum.
„ Jaborandi Liquidum.
„ Nucis Vomicæ Liquidum.
„ Strophanthi.
Glycerinum Acidi Borici.
„ Pepsini.
Hyoscinæ Hydrobromidum.
Hyoscyaminæ Sulphas.
Kaolinum.
Lamellæ Homatropinæ.
Liquor Caoutchouc.
„ Calumbæ Concentratus.
„ Chiratæ „
„ Cuspariæ „
„ Ethyli Nitritis.
„ Hamamelidis.
„ Hydrogenii Peroxidi.
„ Krameriæ Concentratus.
„ Morphinæ Tartratis.
Liquor Pancreatis.
„ Picis Carbonis.
„ Quassiæ Concentratus.
„ Rhei „
„ Sarsæ Co. „
„ Senegæ „
„ Sennæ „
„ Serpentariæ „
„ Thyroidei.
Lithii Citras Effervescens.
Morphinæ Tartras.
Naphthol.
Oleum Rosæ.
Paraffinum Liquidum.
Pilula Quininæ Sulphatis.
Pix Carbonis Præparata.
Pruni Virginianæ Cortex.
Quillaiæ Cortex.
Quininæ Hydrochloridum Acidum.
Salol.
Strychninæ Hydrochloridum.
Suppositoria Belladonnæ.
Syrupus Aromaticus.
„ Calcii Lactophosphatis.
„ Cascaræ Aromaticus.
„ Codeinæ.
„ Ferri Phosphatis cum Quinina et Strychnina.

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Syrupus Glucosi.
„ Pruni Virginianæ.
Terebenum.
Thyroideum Siccum.
Tinctura Ergotæ Ammoniata.
„ Pruni Virginianæ.
„ Quillaiæ.
Trochiscus Acidi Carbolici.
„ Eucalypti Gummi.
Trochiscus Guaiaci Resinæ.
„ Krameriæ.
„ „ et Cocainæ.
Unguentum Aquæ Rosæ.
„ Capsici.
„ Cocainæ.
„ Hydrargyri Oleatis.
„ „ Oxidi Flavi.
„ Paraffini.

Fifteen of these have been introduced rather as sources of other drugs, or as aids for the making or administration of drugs than for their medicinal value.

Araroba is the source of chrysarobin.

Benzol and bisulphide of carbon are only solvents.

Caoutchouc and its solution appear because charta sinapis is made with liquor caoutchouc.

Kaolin comes in as a basis for phosphorus pill.

Liquid paraffin is now used as a means of giving inhalations of active drugs.

Syrup of glucose is made official because it is one of the best pill excipients.

Nineteen of the additions consist of new drugs and their preparations.

The salts of hyoscyamus and hyoscine have long had an established reputation which will no doubt continue.

Solution of ethyl nitrite is a 3 per cent solution of ethyl nitrite in alcohol. It will not take the place of the spirit of nitrous ether as a diaphoretic, but will be chiefly used as a remedy for dyspnœa, for which the spirit, on account of the uncertain amount of ethyl nitrite it contains, is not well fitted.

The solution of hydrogen peroxide has long been used medicinally; and practitioners in ordering it will now get the preparation of standard strength. Each volume must yield 9 to 11 volumes of oxygen when decomposed with sulphuric acid and potassium permanganate.

A solution of pancreas has long been used under the name of liquor pancreaticus. It has been, however, a proprietary preparation. By introducing the liquor pancreatis and adopting to a great extent the formula for its production, which was devised by Sir William Roberts, the Medical Council have recognised the value of the work which this observer did on the digestive power of the pancreatic secretion.

Dried thyroid and thyroid solution are now made official, and thus a fresh departure has been made. In the early days of medicine animal

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substances were frequently employed in the treatment of disease; in fact, they only disappeared from the pharmacopœia at the end of last century. There is no reason to believe that they were otherwise than inert. But the proof given that the thyroid gland contains a something which powerfully influences the nutrition may possibly lead to the knowledge, as it led to the presumption, that other animal tissues contain substances having a powerful effect in certain diseased conditions, and dried thyroid and its solutions may possibly be forerunners of a larger number of medicaments derived from animal tissues.

Coal-tar in an alkaline solution has long been in general use under the name of liquor carbonis detergens; and the solution of coal tar which is now made official, fills a much felt want in the list of official remedies.

Beta-naphthol, notwithstanding its objectionable odour, has proved so valuable that it could not be refused admittance into the Pharmacopœia. It appears as naphthol, for the alpha variety has not been considered worthy of introduction.

Oleum Rosæ, or attar of roses, has been chiefly introduced to give a pleasant odour to a preparation, unguentum aquæ rosæ, made to represent cold cream, which is not only much used in England, but is widely appreciated on the Continent as English cold cream,

Quillaia bark, or at least its tincture, will serve two purposes. It is a valuable agent for emulsification, and is on this account used in the preparation of liquor picis carbonis. It contains a principle similar to that of senega root, and Kobert has recommended it as a substitute for tincture of senegæ.

Salol has firmly established itself in medical practice.

The syrup of lactophosphate of lime gives us an easy and pleasant way of administering a lime salt.

Virginian prune bark and its syrup have been added to the Pharmacopœia chiefly because of the pleasant flavour of the syrup.

Terebene has long been before the medical public, and has fairly well maintained the place which it took soon after its introduction.

The most numerous additions are the preparations of drugs already official. These are 52 in number. Bismuth salicylate has a well-established reputation, and is so largely used that tests for its purity have become very desirable.

Effervescent citrate of caffeine is a very convenient form for the administration of caffeine.

Cocaine is introduced because it is soluble in fats, which the hydrochloride is not. It dissolves in 12 parts of olive oil. It must be remembered, on the other hand, that it is not soluble in glycerine, in which the hydrochloride is very soluble.

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Codeine phosphate is made official because it is one of the most soluble salts of codeine. It dissolves in four parts of water, whereas codeine requires 80 parts for its solution.

The liquid extracts of belladonna, of ipecacuanha, and of nux vomica have been introduced not so much because they are satisfactory preparations, as because they form a convenient starting point for standardising the other preparations of these drugs, almost all of which are made from them. In the pharmacopœia of 1885 the preparations of nux vomica alone were standardised—that is to say, made to contain a definite amount of alkaloids. In the 1898 Pharmacopœia all the preparations of ipecacuanha and belladonna (except the green extract) will contain a definite amount of alkaloids.

The liquid extract of jaborandi is the most convenient form for administering this drug.

The extract of strophanthus supplies a method of giving strophanthus in pill form, which has long been wanting.

The glycerines of boric acid and pepsin have been for a long time largely used, and now become official.

Solution of hamamelis, a spirituous solution of the volatile active principle of the witch hazel leaves, which has been for many years employed under the name of hazeline, now appears in the Pharmacopœia.

Concentrated solutions of chirata, krameria, quassia, sarsaparilla, senega, rhubarb, senna, and serpentaria are important official innovations. It is well known that when infusions are ordered they are rarely made, even by chemists, according to the pharmacopœial directions, but so-called concentrated infusions, supplied by manufacturing chemists, are used instead. In surgeries fresh infusions and decoctions are almost unknown. Where infusions are made of drugs containing essential oils, the fresh infusion differs materially from the substitute made from concentrated preparations, but the difference is hardly recognisable in the case of substances containing no essential oil. The drugs of which the concentrated solutions have been made official do not contain essential oils, and it will be difficult to tell the difference between mixtures made with these solutions and those made of fresh infusions. Nevertheless, the Pharmacopœia of 1898 gives no authority for the use of these solutions when infusions are ordered. It simply states that the concentrated solutions made official may be ordered instead of infusions, and it gives a formula for making these concentrated solutions. All of them contain a certain proportion of alcohol, and they are, therefore, not called concentrated infusions. The same, however, is true of the concentrated preparations called infusions, which are now so largely used. It is to be hoped that this suggestion, as to the use of concentrated preparations instead of infusions, will be acted upon.

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They will be more uniform in composition than infusions, and ought in time to replace them.

Effervescent citrate of lithia will be found a useful preparation of this metal.

Tartrate of morphia has been introduced because it is one of the most stable and soluble of the morphine salts. The hypodermic injection will in future be made of it. The acetate is liable to decompose.

Quinine pills are so often given that it has been advisable to give a formula for their preparation. By using tartaric acid, glycerine, and tragacanth, four or five grains of quinine can easily be given in one pill. In the old form of 1874 (omitted in 1885) confection of hips was used, and the pill was much more bulky.

The acid hydrochloride of quinine is a very soluble salt. It dissolves in its own weight of water, forming a somewhat acid solution. The hydrochlorate and sulphate require 35 parts and 800 parts respectively to dissolve them. Acid hydrochloride is used sometimes for subcutaneous injections.

Strychnine hydrochloride has been introduced for the purpose of making liquor strychninæ hydrochloridi.

Belladonna suppository has long been largely used, and is a useful addition to the official preparations.

Aromatic syrup containing tincture of orange and cinnamon and the syrup of Virginian prune are useful flavouring agents, and the pharmacopœia has lacked such agents.

The syrup of codeine will be a very useful, mild sedative.

Aromatic syrup of cascara is satisfactory and pleasant, and the syrup of phosphate of quinine and iron a valuable tonic.

Terebene seems to have firmly established itself as a useful remedy in bronchitis.

The ammoniated tincture of ergot has long been known as one of the most reliable preparations of this drug.

The lozenges of phenol, eucalyptus, guaiacum, krameria, and krameria and cocaine will form useful additions to the pharmacopœia, so far as regards convenience for administration. The phenol lozenge has long been required, and the pharmacopœia of 1885 was deficient in pleasant astringent lozenges.

The ointments of capsicum and yellow oxide of mercury have long been in extensive use. The ointment of rose water will be found a far better preparation than the simple ointment which it replaces; whilst the paraffin ointment, a mixture of hard and soft paraffin, makes an excellent basis for other ointments.

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Surprise will doubtless be felt that many much-used substances and preparations have not been made official, and it might have been well, perhaps, if the list of the new pharmacopœial substances had been larger; but it was found that many of them are proprietary preparations; and although this has not always been held as a complete bar to admission, as in the case of antipyrin, nevertheless it has not been deemed desirable to advertise private preparations by admitting them into the pharmacopœia without good cause. Chloralamide, for example, is at present a proprietary article. It can be purchased now just as well as if it were in the pharmacopœia, and since it can only be made by one foreign firm, purity tests would be of no service.

The popularity of many substances which once seemed likely to come into general use seems waning, and it would be unsatisfactory to introduce substances which are rather likely to fall in the estimation of the medical public.

Many suggestions have been made concerning the introduction of capsules, granules, tabloids, and the like, but it has been thought better to avoid giving instructions for making such forms. Any process given would probably not be generally followed, since each manufacturing chemist has his own way of making them; but by a sentence on page 19 in the preface to the Pharmacopœia, the purity of the drugs in these forms is to a certain extent secured, for it is stated the drugs in them must respond to all the official characters and tests.

CHANGES IN MODE OF PREPARATION.

With the progress of pharmacy better methods have been devised for making a large number of the official preparations than those which are set forth in the pharmacopœia of 1885, and it is well known that some of the preparations are not usually made by pharmacists in the manner prescribed in the Pharmacopœia. There were, in fact, one or two preparations that could not be made if the pharmacopœial methods were closely followed, as, for example, acetum cantharidis. The Committee of Pharmacists have revised every process, and, in the majority of cases, have made alterations more or less considerable. Hence it comes to pass that almost every page of the Pharmacopœia exhibits evidences of some alteration. Such changes interest the pharmacists more than the medical practitioner, and I do not propose to dwell upon them. I will only allude to a few instances of these changes. The tinctures were formerly made with either proof or rectified spirit, but it has been found that in some cases a spirit differing in strength from either of these two makes the best menstruum for tinctures; hence it has come to pass that a series of diluted alcohols have been made official. We have alcohol 90 per cent, alcohol 70 per cent, alcohol 60 per cent, alcohol 45

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per cent, and alcohol 20 per cent. Great changes, too, have been made with regard to the method of using the menstrua by maceration, percolation, and so on.

In many of the pills bitter excipients have been used; the old confections employed for this purpose have been discarded, and syrupus glucosi, which has long been known as one of the best excipients, has been introduced.

The ointments have undergone considerable change, and the bases of a considerable number of them have been improved. This will be seen by a reference to a table of the strength of ointments which will be given in the section on changes in strength and preparations.

CHANGES IN TESTS AND DESCRIPTIONS.

The tests of the pharmacopœia of 1885 were defective, many of them were of a somewhat rudimentary character, some were fallacious, and altogether they were insufficient; under any circumstances they wanted complete revision, but this became the more necessary when the method of the making of the compounds was omitted, for this required that the test for purity should be more stringent. An alteration has been made in almost every one of the paragraphs in the tests for purity, and a large number of new tests have been introduced. There are two noteworthy changes. In previous pharmacopœias a constant repetition of certain reactions occurred. In the case of every soluble sulphate, for example, and wherever a sulphate had to be tested for, the barium reaction was set forth. In the new Pharmacopœia the ordinary reactions are placed in an appendix at the end of the book, and a simple reference is made to them; thus, in the case of sulphates, or substances which may be contaminated with sulphates, it is simply said that the substance does or does not yield a reaction with the tests for sulphates.

The other change is the indication of the impurity for which each test is intended. In former pharmacopœias the purpose for which the several tests were inserted was not stated. In the 1898 edition the impurity indicated by the test is put in brackets at the end of the description of the test. To medical men especially this will be of service, for it gives information as to the impurities which are possibly present; moreover, though the purpose of the tests was easily recognised by chemists, medical men, and especially students, found great difficulty sometimes in ascertaining the purport of these tests.

The descriptions of the various articles in the Materia Medica have undergone complete revision at the hands of the pharmacists. Botanical descriptions have been also thoroughly revised by them and the botanical referees. No subject gave the Pharmacopœia Committee more trouble

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than the description of drugs and botanical references, for they had to recognise, as far as possible, very opposite opinions on the part of experts. This is a matter, however, which does not specially interest practitioners. It is sufficient to point out that almost every article bearing on the description, source, and botanical origin of drugs has undergone some modification.

CHANGES IN NOMENCLATURE.

Many small changes have been made in nomenclature which will not greatly interest practitioners. It matters not to them whether lard is called adeps preparatus, as in the old pharmacopœia, or simply adeps, as in the new. Nor will the fact that hydrochlorates are in future to be called hydrochlorides, thus following the ordinary chemical nomenclature, be considered of importance, although it is well for medical students to note this change. But there are a few alterations in nomenclature which, perhaps, require explanation. In the first place it will be seen that the English name of a substance is by no means always a translation of the Latin name. Acidum carbolicum is translated phenol, not carbolic acid; and acidum arseniosum, arsenious anhydride, though arsenious acid is inserted as a synomyn. The reason of this is that many of the Latin names do not represent the real state of knowledge as to what the thing itself is, as acidum carbolicum and acidum arseniosum are not regarded as true acids. But it has not been thought well to change the Latin names owing to the inconvenience that such change might cause in prescribing. The English names are made to represent our views of the nature of the drug, as in the case of phenol and arsenious anhydride.

In the case of the alcoholic liquids this system of nomenclature has led to considerable changes in names.

In the pharmacopœia of 1885 spiritus rectificatus meant a mixture of 88·76 parts by volume of ethylic alcohol C_2H_5OH with 11·24 of water. In the 1898 Pharmacopœia spiritus rectificatus means 90 parts by volume of alcohol and 10 of water; and the English name of this mixture is "alcohol (90 per cent)," though the words "rectified spirit" are given as a synonym. Again, in the pharmacopœia of 1885, what is commonly known as absolute alcohol was called ethylic alcohol. As a fact, it was really ethylic alcohol, with 1 per cent of water; and it has been thought well in the new Pharmacopœia to call this alcohol absolutum or absolute alcohol.

Still another change has been made. Where alcohol is spoken of in a chemical sense—that is, where we allude to reactions with C_2H_5OH—the words ethyl hydroxide are used; whilst the words ethylic alcohol are employed in a general sense to mean alcohol of any strength.

The definition of absolute alcohol illustrates the use of these terms.

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It is described as "ethyl hydroxide C_2H_5OH, with not more than 1 per cent by weight of water obtained by the removal of water from less strong ethylic alcohol and subsequent distillation." A few other changes in nomenclature may be noted. Pomegranate bark formerly meant the bark of the root alone, and it was therefore called granati radicis cortex, now it is called granati cortex, but this means that the bark of the stem, as well as the root, is made official. Of course a similar change has taken place in the name of the decoction, and it is now decoctum granati cortex, instead of decoctum granati radicis. The injectio ergotini hypodermica will in future be known as injectio ergotæ hypodermica, the change being made, of course, because the extractum ergotæ, not the so called ergotinum, is now official. The solution of hydrochloride of cocaine is more used as an injection than for any other purpose. Its name is therefore altered from liquor cocainæ hydrochloratis to injectio cocainæ hypodermica.

The words aloin, pepsin, and pyroxylin are altered to aloinum, pepsinum, and pyroxylinum, and thus made declinable.

The official name of cascara sagrada bark was rhamni purshiani cortex in the 1885 pharmacopœia. This name now disappears except as a synonym, and cascara sagrada is substituted.

Tabellæ nitroglycerini becomes tabellæ trinitrini. This brings it in a line with the solutions, and is advantageous in that nitro-glycerine is a thing that the people think they understand. Argenti et potassii nitras and "toughened nitrate of silver" are in future to be known as argenti nitras mitigatus and argenti nitras induratus.

The last two names illustrate a change which has been made throughout the Pharmacopœia. Hitherto words ending in "as," such as carbonas, tartras, etc., have been regarded in the English pharmacopœia as feminine, while on the Continent and in America they are made masculine. The English Pharmacopœia is now brought into line with all other pharmacopœias. Hence we have potassi tartras acidus instead of potassi tartras acida, and in all other cases the words ending in "as" are regarded as masculine.

(*To be continued.*)

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SOME AMERICAN OPINIONS AND STATISTICS IN RELATION TO THE USE OF WATER GAS AS A MEANS OF DOMESTIC ILLUMINATION.

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AMERICA has been called the "home of water gas," and the advocates of the introduction of water gas into this country have on many occasions triumphantly appealed to the experience gained in the United States as affording ample and satisfactory evidence of its harmlessness and freedom from injurious properties. The opinions of American experts have been quoted to show that the opposition to the use of water gas is founded on ignorance and perverse misrepresentation of its perfectly innocent nature. Several papers recently published in American journals seem to indicate that even in its "home," water gas is regarded as anything but an unmixed blessing; and not undeservedly so, if statistics count for aught. In a paper published in the *Medical and Surgical Reporter* (Philadelphia, 1897), entitled "Philadelphia's Gas Supply in its Relations to the Public Health: A Comparison of the Injurious Effects of Coal Gas and Water Gas," by Dr. Lautenbach, we not only find some valuable information, but we also have the curtain drawn aside and the quality of the "expert" testimony in favour of water gas revealed.

Dr. Lautenbach prefaces his remarks by quoting a resolution adopted by the College of Physicians of Philadelphia, which was the outcome of an investigation made by a specially-appointed committee to report on the subject of water gas. The gist of the resolution is to the effect that, having learned that it is proposed to furnish the citizens of Philadelphia with illuminating gas, consisting of two parts of coal gas and one part of water gas—a mixture that will probably contain at least 13 per cent of carbonic oxide—and being of the opinion that the use of illuminating gas which contains more than 10 per cent of carbonic oxide would be attended with very great risk to health and life, the College petitions the Mayor of Philadelphia to render it certain that, if water gas be used, the amount of carbonic oxide in the illuminating gas shall at no time exceed 10 per cent.

After describing the process of manufacturing carburetted water gas, or, as it is sometimes clumsily called, water oil gas, and mentioning that it contains from four to six times as much carbon monoxide as does coal gas, Dr. Lautenbach states that he consulted a number of recent pamphlets on the subject, some of which contain astounding evidence

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from chemists and medical men occupying chairs in colleges and universities. He further addressed letters of inquiry to a number of chemists, plumbers, gas officials and employees, from whom he naturally received more or less contradictory answers.

First, as to the evidence (in many instances in the form of sworn testimony) given by the professors of chemistry and doctors of medicine occupying important official positions. One says "it is not proved that carbonic oxide is a more noxious or deleterious ingredient in gas than the various hydrocarbons, and I do not think it has been shown that gas containing twice or three times as much carbonic oxide as ordinary coal gas is really any more dangerous than the ordinary illuminating gas." Another says, "As to the comparative danger to life, if there be an open tap or leak in a bedroom in the case of coal gas or water gas, I think there can be no great difference." A third gave sworn evidence that "illuminating gas containing a predominance of carbonic oxide was almost in every respect safer for public use than one in which marsh gas predominates, and in no respect less safe." A joint production, signed officially by the President of the Health Department of New York and a professor of the College of Pharmacy in the same city, runs thus: "Water gas is no more dangerous to life and health than coal gas, and there is no just ground, so far as health and life are concerned, to prohibit its manufacture."

It is a waste of space to quote such evidence, but it is impossible to refrain from citing three more specimens which throw some light on the well-known American definition of an expert witness. They are taken in the order in which they appear in Dr. Lautenbach's paper, where they are ingeniously arranged in an ascending gamut of mendacity, aptly illustrating the degrees of comparison formulated in the three predicates of the above-mentioned definition. Expert No. 1 is ambiguous, and says: "There can be no great difference between coal gas and water gas as to danger." No. 2 is assertive, and says: "Water gas is not more dangerous in case of leakage than coal gas." Whilst No. 3 is superlative, and easily attains the acme of expertism by boldly testifying that "water gas is less dangerous in case of leakage than gas made from coal!" Such is the kind of evidence behind which some gas companies and committees entrench themselves when their actions with respect to water gas are questioned.

After reading statements so utterly opposed to all knowledge one breathes more freely on learning that, in reply to Dr. Lautenbach's enquiries, the Philadelphian plumbers, brushing sophistry aside, state that their "workmen are more easily affected by the present mixed gas than by the former coal gas." It is refreshing also to know that, to a man, the chemists of Philadelphia believe and confess that water gas is

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more potent for evil than is coal gas. Nor are there wanting many others who have not bowed the knee to water gas; numerous professors and teachers, with a dignified regard for their position, have spoken out boldly, and have protested against its use, giving ample reasons for their assertions that, as a domestic illuminant, water gas is in the highest degree dangerous to life and health.

The extremely poisonous nature of water gas is illustrated in a practical manner by the numerous accidents which happen in America to workmen in the employ of water gas companies, the results being very much more critical than those produced by coal gas. So well is the dangerous property of the gas understood that, when seeking for or repairing a leak, the workmen are warned, and are at once removed from their work if they feel the slightest effects.

The following table of the relative number of deaths from the inhalation of coal gas and of water gas in New York City and in Boston was compiled by Dr. Raymond, of Brooklyn, and Mr. Greenough, of Boston :—

Year.	Water Gas.	Coal Gas.
1880	14	1
1881	18	3
1882	22	2
1883	24	0
1884	19	2
1885	18	0
1886	35	1
1887	27	0
Total	177	9

In Boston, where coal gas only was used, there were, during these eight years, but 3 deaths from the inhalation of gas, whilst in five years (1883 to 1887) in Baltimore, where water gas is used, there were 45 deaths. During these five years the total out-put of gas in Boston, with a population of 448,000, exceeded the total out-put of gas in Baltimore, with a population of 434,000, and yet the death-rate from the inhalation of gas was only 2 for Boston against 45 for Baltimore. According to Witthaus (Forensic Medicine and Toxicology) "nearly one half of the accidental poisonings in New York City in 1889—1892 were by illuminating gas, *i.e.*, carburetted water gas, and the same agent was used by suicides more frequently than any other poison, except Paris green and rat poison."

Dr. Cattell, Senior Coroner's Physician, Philadelphia, states that 34 deaths from carbon monoxide poisoning by illuminating gas occurred in Philadelphia during the year 1897; of these 2 were homicidal, 14 acci-

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dental, and 18 suicidal. In the December number, 1897, of the *Medico-Legal Journal* of New York is a paper on "Gas Poisoning," by Professors M'Vey and Grinfield-Coxwell, of Boston, which contains the following quotation from the Reports of the Gas Commissioners of Massachusetts for 1896: "That in the space of one year 51 deaths had occurred from the effects of gas poisoning, many had been injured, and whole families had been prostrated, and some affected for life, by inhaling the poisonous substance, namely, water gas. The statement of authorities, as conditions are now in the City of Boston [after the introduction of water gas], is that death lurks in every household."

Notwithstanding statistics like those above cited, and others of an equally convincing character, there are to be found men occupying the position of managers of gas companies who not only state that "water gas is not any more poisonous to life and health than coal gas," but who show that they are absolutely impervious to the influence of facts by asseverating that "it [water gas] has not caused any more deaths for equal quantities of gas consumed"!

The extraordinary statements made by some "authorities," not inaptly termed by our American friends "gas-experts," evince an utter absence of knowledge as to the way in which water gas acts as a poison. To take one example:—As might be reasonably expected, when experts evolve their toxicological knowledge each from his inner consciousness, the "science" produced will be uncertain of application, and will be likely to prove self-contradictory. Thus, some gas experts state that the hydrocarbons in gas are quite as poisonous as, or even more so than, the carbonic oxide; whilst others maintain that the large proportion of hydrocarbons which are present in carburetted water gas makes it *less* deadly; their contention being that the hydrocarbons in some way neutralise the poisonous property of the carbonic oxide, and that for this reason carburetted water gas, although it contains more carbonic oxide, may be less poisonous than coal gas. Both of these assertions are contradicted by universal experience, though those who make the latter assertion have some claim to appeal to facts in support of their views. From the toxicological standpoint the hydrocarbons in illuminating gas are almost inert; if respired, their noxious action is limited to the displacement of an equal volume of oxygen; beyond this they do little harm. Therefore, when added to water gas, in order to produce carburetted water gas, their action is to lessen the toxicity of the compound gas to an extent which is equal to the amount of carbonic oxide that has been displaced; that is to say, they merely dilute the poison, but in no other way do they lessen its potency, nor do they add thereto. The simple fact being that the poisonous property of illuminating gas—whether coal gas or water gas—is essentially due to the carbon monoxide

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which it contains, and, practically speaking, to no other component; therefore, its toxic potency is expressed solely by the percentage of the carbon monoxide which is present. This being the case, it is lamentable that men of scientific position should permit their names to be appended to statements which are mere assertions, no attempt being made to support them by reference to experimental or other evidence, and which cannot be justified nor defended on scientific grounds. It is one thing to say that with due precautions water gas may be safely used—that is a matter of opinion; but to say that "water gas is no more poisonous than coal gas," or that "gas which contains three times as much carbonic oxide as ordinary coal gas is no more dangerous than ordinary coal gas," or that "carbonic oxide in the presence of hydrogen is not more poisonous than carburetted hydrogen," is to state that which anyone who lays claim to the position of an expert knows, or ought to know, is not true. Every one must sympathise most heartily with the desire that of late has been frequently expressed in some of the American journals to the effect that all gentlemen who lay claim to the title of expert witness should give proof that they have a competent knowledge of the subject or subjects about which they purpose giving expert evidence.

ON ECZEMA OF THE HANDS.

By H. G. BROOKE, B.A., M.B.,
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Probably none of the commoner diseases of the skin give rise to so much and so long continued pain and inconvenience as the various eczematous conditions of the hands. In whatever form the disease presents itself, whether acutely as a general inflammatory state of the whole skin with swelling and exudation, or as outbreaks of vesicular patches, or as groups of larger papules which quickly rupture and ooze, or again in the more chronic forms such as that of erythematous squamous patches, or that marked with more induration and excess of an abnormal horny layer leading usually to the production of fissures, or in that general hyperkeratisation in which the whole hand is as it were covered with a leather glove which hampers its movements so as to render it practically useless, its course is often marked by a series of relapses which disappoints the physician and brings the patient to despair. The reason of this is not far to seek. The hand, the natural tool of man, to the development of which he seems to owe very largely his pre-eminent position in the animal world, is incessantly in use, and the

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intense inconvenience of keeping it protected from all the irritants, physical, chemical, and bacteriological, with which it comes at every moment into contact in performing the ordinary work of life, either prevent the lesions from attempting to heal, or stir up those which are healing into renewed activity. This unrest and the difficulty in keeping the necessary treatment continuously applied, together with the various irritations of internal origin with which many cases are complicated, furnish a ready explanation of the constant recurrences of the acute symptoms.

It is impossible to treat of the different forms of eczema which attack the hands without entering to some extent into the question of the etiology of the disease. And here we are at once met with all the doubts and uncertainties which still beset even the very definition of the word eczema itself. For want of a clear knowledge of the histological differences which underly its apparently similar clinical developments we are driven to empirical clinical experience, which can only be gained laboriously by each individual, instead of having some generally applicable criterion by which we can determine as to which among the many polyform eruptions are really eczematous, and which are merely simulations or mimicries of the disease. Formerly it was thought that vesico-papules which agglomerated into groups, and oozed and formed red scaly lesions, were a sufficiently distinctive feature, but the French school have for long insisted on the distinction between a vesiculating dermatitis with "eczematoid" characters due to obvious local irritants, and the disease which depends for its existence and extension not on a merely topical excitation, but on a state of the general system which predisposed the skin to take on this peculiar form of inflammatory process. And the difficulty is now the greater since the introduction of the bacterial factor into the question. Years ago a class of eczematous eruptions had been noticed in which the contour and development of the lesions was so strikingly like those of ringworm that the observers had not hesitated to label them as parasitic. But it was not until Unna in 1889 boldly declared that all eczemas were of parasitic origin, and that the constitutional condition of the patient was only of secondary importance, that the present confusion began.

Not only medical practitioners, but even the public, had noticed how eczematous conditions, and especially those on the hands, had varied with attacks of gout or rheumatism, and how indulgence in certain foods or drinks, as, for example, too much dining out, with liberal allowance of champagne, had caused an acute outbreak of vesicles to appear. And it was also obvious that persons engaged in certain trades, such as dyeing, or varnishing, or laundry work, were prone to suffer from eruptions on the hands of an eczematous character, which recurred at once

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whenever they exercised their calling. It can be imagined, therefore, that the opposition to Unna's view was a very active one. Bulkeley, of New York, for instance, had cited cases as being of neurotic origin in which fresh crops of acute vesicles occurred whenever certain employments were resumed by the patients which involved only brain work, or in which localised attacks followed prolonged action, as on the right arm whenever much used in writing. Neisser, on the other hand, tells of a medical man, whom he saw, who had been treated by a number of colleagues for what they had all regarded as a general constitutional eczema, but which relapsed continually until it was found to be due entirely to an exaggerated susceptibility to iodoform, and which ceased entirely when all contact with the drug was carefully avoided.

These eruptions were evidently eczematous in character, for they were diagnosed by competent observers, and it would be difficult without the presence of some absolute criterion to allow that they were of microbic origin.

Unna regards the morococcus as being the specific cause of the eczematous eruptions, explaining its ability to produce vesicles by its power of attracting serum from the blood vessels (serotasis). This power it exercises from its position in the outer epithelial layers in the more active and stormy vesicles of the acute stage. He believes that the ordinary conception of the course of an eczematous process is correct, that it does not begin as a vesicle and pass on to the squamous stage, but that in the great majority of cases, as Erasmus Wilson and McCall Anderson had pointed out previously, as a squamous affection to which the vesicles were a by no means necessary epiphenomenon. It is only exceptionally that the vesical is the primary lesion.

From a careful examination of a large number of cases, I am convinced that this view is correct, and that it is the chronic disease which becomes acute far more frequently than the acute disease becomes chronic. But there are, nevertheless, a certain number of cases which have every appearance of ordinary eczema, and which break out acutely on previously healthy skins under the direct influence of ascertainable causes, as in the cases referred to by Bulkeley and Neisser, or in those in which the eruptions appear rapidly after contact with certain chemical substances, such as aniline dyes.

It is impossible for us, in the present state of our knowledge, to disregard cases of this kind and include all eczematous eruptions in the category of parasitic dermatoses. Whether they may be found to present different histological conditions which could differentiate cases undistinguishable to the naked eye remains to be seen; but for the present our only practical criterion, chemical examination and observation, compels us to regard them as non-parasitic in origin.

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Blaschka (*Archiv f. Derm. u. Syph.*, 1892, Heft 1) has pointed out that the eruptions on the hands caused by contact with irritating substances ought to be divided into two classes—(1) Those in which the eruption is acute and erythematous, caused by a direct poisoning influence on the deeper tissues, and especially on the blood vessels; and (2) those in which the poisonous substances act as irritants, destroying the epithelium and producing eczematous eruptions. The latter class are in every way clinically undistinguishable from other eczemas, and for them the designation "trade eczema" should be reserved.

Blaschka opposes Unna's theory that such eczemas are always due to an acute irritation of skins which were previously infected with micro-organisms, even though it may be in only a slight degree; for they have occurred in skins in which, after careful searching, he was unable to find the slightest trace of any other abnormality. And instances are well known in which the eczematous symptoms occur only after contact with certain specific irritants, such as cinnamic ether, carbonic acid, or sublimate, without any previous signs of eczema having ever been noticed.

It is generally acknowledged that a trade eczema does not always subside and disappear when the cause of the irritation is withdrawn, but may become the starting point of chronic eczema, even in skins which had been previously exempt. These eruptions, after lasting some time, will frequently be found to have taken on the gyrate or circinate outline which is so suggestive of parasitic infection; and, as such lesions require the application of antiparasitics for their removal, it may be considered as fairly certain that the injuries inflicted by the irritant on the epidermis have opened the way to the colonisation of the skin by micro-organisms which tend to keep up the eczematous state.

The converse process, however, is in my experience far more frequent; it is the existence of a previous eczematous condition of the hands which renders the patient liable to irritation by substances used in the business in which he is engaged, and to consequent acute recrudescences of his older trouble.

This is a point of great practical importance, for the medical adviser is often asked as to the possibility of the patient being able to continue his work, or the necessity of his having to give it up and betake himself to some other form of employment, an alternative which, in the case of a skilled workman, may mean a considerable loss of income. If the business is one in which the patient has been engaged for some time, and in which he has been immune until recently, then no answer can be given until he has been suspended from contact with the cause of irritation, of whatever kind it may be, and the skin thoroughly cleared from every trace of eczematous infiltration. If he is then again attacked, after restarting his work, it will be better for him to change his employ-

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ment. If, however, he is attacked shortly after commencing a new employment, then, as Blaschko points out, it is chiefly a matter of individual power of accommodation as to whether he will be able to continue. In most people the skin of the hands will gradually harden itself to resist anything short of actual caustics, and when once this power has been gained it is usually preserved. But, owing to some alteration which it is often impossible to discover, this immunity may suddenly be lost, even after years, and if not regained by rest and treatment, the employment will have to be abandoned. This is also obviously the only course open in those whose skins prove intolerant from the first, and have not the power of accommodating themselves to the irritant.

The greater part of what has been said about "trade eczema" applies to other eczematous conditions of the hands generally. Acute vesicular eczema of the hands alone is not common except as the result of direct irritation, chemical or physical; it is nearly always accompanied by signs of eczema elsewhere. Or it may be that there are only signs of seborrhoic dermatitis, say, on the head and face, the acute eczematous form being confined to the hands. In such cases the seborrhoic origin of acute vesicular patches on an otherwise healthy hand is simply a matter of surmise, but one which clinical experience, our only available guide, tells us to be possible and probable.

Odd patches of acute "parasitic" papular vesicular eczema of the dorsa of the hands and fingers are found often on the hands alone, and, although, perhaps, more common there, do not differ from similar patches elsewhere. The hands are evidently more exposed to contamination, and when once infected are more liable to have the foci provoked to inflammation by the inevitable irritations of daily life, such as washing, heat, friction, foreign substances, and the inoculation of pus, cocci, and other micro-organisms.

But there is one form of eczema which is often entirely confined to palms, sometimes to the palms and soles, and generally remains in one or both of these regions without spreading to the rest of the skin.

Dr. Allan Jamieson has recently described it very clearly (*Edinburgh Medical Journal*, January, 1898). The patient comes with a history perhaps of burning and itching in the palms, which are covered more or less completely with hard, horned, or scaly, infiltrated patches, and penetrated by cracks and fissures. The inelasticity of the thickened epithelium (parakeratosis) and the pain of the fissures keep the hand in a semi-closed condition. The striking point is the limitation to the palm and palmar surfaces of the skin, the region of normal physiological hyperkeratinisation. The patients usually complain most of the burning feeling, and the inflammatory area may be easily seen extending on to

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the sides of the hand and fingers, just beyond the limits of the alteration in the epithelium. The palm may be felt to be hot and dry in comparison with the dorsum of the hand, and the perspiratory function is usually quite suspended. The description applies equally to the affection when found on the sole, but the dryness is not usually so great on the sole as on the palm, although the epithelium there is thicker, owing to the protection afforded to the skin by the foot gear.

I have found the condition almost exclusively in middle-aged or elderly people, and especially in women, though it may occur in younger people. Its etiology is obscure, but that vasomotor disturbance of the centres supplying the palms and soles is largely responsible for its development is shown by the persistency of the redness and burning sensation after the infiltration and cracks have been removed by treatment, and their proneness to recur quickly if this redness persists.

The internal treatment of eczematous conditions of the hands does not vary from that of the disease occurring in other parts of the body, except that the hands seem certainly more prone to be influenced by states of faulty metabolism (gout, dyspepsia,) and nerve exhaustion, and the correction of such abnormalities is often essential to the success of the treatment. In some persistent cases I have been unable to discover any deviation from general good health, and the patients have insisted that they were perfectly well. The routine administration of arsenic, which is so frequently practised, is to be deprecated. Bulkeley has recommended it in small hourly doses for a day or two for the purpose of aborting acute vesicular attacks about the hands, and in more chronic cases it seems to have an influence in removing eczematous alterations of the nails, to which they give rise. But its effect is in no way specific, and its direct effect is not comparable to the results obtainable by good local treatment. It can therefore only be regarded as an occasional auxiliary.

For local treatment it is impossible in the limits of a short article to give more than general indications, the exact choice of remedies depending upon the condition with which we have to deal, the amount and extent of the inflammation, its acuteness or chronicity, the degree of infiltration and hyperkeratinisation, and finally—a most important item—on the will and ability of the patient to give the necessary care and attention to their application.

There are two points in which the treatment of eczema of the hands presents special difficulties—the tendency to the development of horny scales on the palmar surface, and the difficulty of obtaining the requisite rest and protection.

If acute inflammation is present, the abnormally-thickened epithelium must be removed by soaking with bran or starch water, rendered anti-

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septic by dissolving in it boracic acid or some creosol preparation; but better still, if possible, by the continuous application of compresses saturated with a 1—2 per cent watery solution of resorcin. After this the treatment can be continued in the usual way with lead, tar, mercurials, sulphur, ichthyol, salicylic acid, etc., according to the indications.

If the patches are not so acute, the keratosed patches may be cleared with salicylic acid applied as a plaster, either alone or in combination with other remedies, such as tar and mercurials. For the restoration of normal keratinisation, Jamieson recommends the softening and removal of the thickened epithelium by the continuous application of boracic starch poultices and gentle friction, followed by the application of an ointment containing 5·30 grains of Unna's oxidised pyrogallol to the ounce. Its action he finds to be exceptionally rapid and apparently permanent.

The main point to be attained is not merely the removal of inflammatory and inconvenient symptoms, but the absolute obliteration of the last remnants of eczematous infiltration—a task not only requiring the care of the medical attendant, but the persistent and intelligent co-operation of the patient, which it is often difficult or impossible to secure. But it is undoubtedly the failure to effect this complete removal which is responsible for the usual chronicity of these cases, and causes them, instead of being finally healed by one bout of thorough and continuous treatment, to drag on in a weary series of relapses for months or even years.

THE PATHOLOGY AND TREATMENT OF FISSURE AND ULCER OF THE ANUS.

By J. E. PLATT, M.S. (Lond.), F.R.C.S.,
Surgical Officer to the Cancer Hospital; late Resident Surgical Officer to the Manchester Royal Infirmary.

In text-books of the present day we find two very different accounts of the pathology of fissure and ulcer of the anus. Until a few years ago the theory held with regard to the whole of these cases was as follows: An abrasion of the mucous membrane of the anal outlet having been produced during the passage of fæces or from other cause, irritation and reflex spasm of the sphincter muscles were set up, and, consequently, healing was prevented. This theory was ably supported by Hilton,*

* "Lectures on Rest and Pain," 1st Edit., pp. 278—284.

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who gave excellent diagrams illustrating the ways in which the reflex impulses are transmitted. More recently, Mr. Ball has advanced an altogether different view of the pathology, which he is quite satisfied is "the true explanation of the formation of the vast majority, if not all, painful fissures." †

For a number of years past I have taken every opportunity of examining these cases, with the object of determining which of the above views is correct, and have come to the conclusion that both views hold good for certain cases, and that under the above title are usually described together two distinct affections which have an altogether different pathology, and which to a certain extent have different symptoms, and require different treatment.

In order to understand these affections, it is necessary to consider some points in the anatomy of the lower end of the rectum, and attention may be called to the fact that the description of this region, given in anatomical text-books, has been considerably modified during recent years. Some of the anatomical features are illustrated by the accompanying diagrams (Figs. 1 and 2). The third part of the rectum is a passage about one inch in length, the walls of which are always in contact, except during the act of defæcation. This portion of the gut, or *anal canal*, as it is usually called, commences about an inch in front of the tip of the coccyx, and proceeds downwards and somewhat backwards to the anal outlet. It is surrounded by the external and internal sphincter muscles. The internal sphincter, which is continuous above with the circular muscular fibres of the second part of the rectum, surrounds almost the whole length of the anal canal. The external sphincter, as shown in Fig. 1, is composed of three parts, which encircle the anal orifice and the lowest portion of the canal. The mucous membrane of the anal canal is smooth and free from rugæ; it is bounded superiorly by the *linea dentata*, at the junction of the second and third parts of the rectum. From the linea dentata a number of longitudinal bands of mucous membrane, the *columns of Morgagni*, extend upwards into the second part of the rectum. Connecting together the lower ends of the columns of Morgagni are a number of folds of mucous membrane, the *anal valves* or *valves of Morgagni*. In considering the pathology of fissure and ulcer of the anus, the anal valves are of the greatest importance, and therefore it is essential to note their exact arrangement. The free edges of the valves are directed upwards, and the little pockets above them form the lowermost boundaries of the depressions between the columns of Morgagni. In shape they have been compared to the semilunar valves of the aortic and pulmonary orifices of the heart, but

† "The Rectum and Anus," 2nd Edit., 1894, p. 137.

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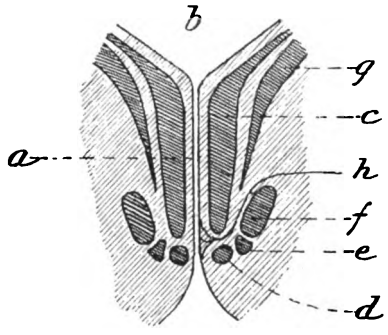

FIG. 1.

DIAGRAM OF A TRANSVERSE SECTION THROUGH THE WHOLE LENGTH OF THE ANAL CANAL.

a. Anal Canal.

b. Second Part of Rectum.

c. Sphincter Ani Internus.

d. e. f. The three parts of the Sphincter Ani Externus.

d. Sphincter Ani Externus Subcutaneus.

e. „ „ „ Superficialis.

f. „ „ „ Profundus.

g. Levator Ani.

h. Terminal branches of the Inferior Hæmorrhoidal Nerve, passing between the internal and external sphincter muscles, and being distributed to the neighbourhood of the muco-cutaneous junction

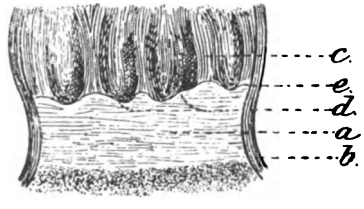

FIG. 2.

DIAGRAM OF THE MUCOUS MEMBRANE OF THE LOWER END OF THE RECTUM.

a. Mucous Membrane of the Anal Canal.

b. Muco-cutaneous Junction.

c. One of the Columns of Morgagni.

d. Anal Valves.

e. Linea Dentata.

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their size varies considerably in different individuals. In some cases they form well-marked folds, whilst in others they are quite rudimentary. From an embryological point of view, the anal valves are also of considerable importance. The second part of the rectum, which is lined by columnar epithelium, is developed from the primitive alimentary canal or mesenteron (hypoblast) of the embryo; whilst the anal canal, which has a lining of scaly epithelium, is developed from the infolding of epiblast or proctodæum, by which the hinder end of the gut comes to communicate with the exterior. This junction takes place at a point corresponding to the linea dentata, and the anal valves appear to be remnants of the membrane which for a time separated the mesenteron from the proctodæum.

The nerve-supply of the mucous membrane of the anal canal is derived chiefly from the inferior hæmorrhoidal nerves. The terminal branches of these nerves reach the mucous membrane by passing between the external and internal sphincter muscles. They supply a very large number of filaments to the mucous membrane at the verge of the anus, and hence we have an explanation of the fact that lesions of the muco-cutaneous junction are apt to be much more painful than lesions situated in the anal canal itself.

As already stated, I have formed the opinion that there are two distinct forms of fissure and ulcer of the anus. The following is a brief account of the two conditions:—

(1) The first is situated at the junction of skin and mucous membrane, most frequently at the back part of the anal outlet, and usually takes the form of a small vertical fissure. Amongst the causes of this variety of fissure, the following may be mentioned: The passage of hard fæces, severe diarrhœa, want of cleanliness, eczema, syphilis, laceration during confinement, and congenital stenosis of the anus. In some cases, especially in those due to syphilis, more than one lesion is present. The fissure is extremely painful, owing to the very free supply of nerves to the muco-cutaneous junction, and not infrequently one or more nerve filaments are exposed in it. This may be demonstrated by careful examination with a probe, when it will be found that one or two points of the fissure are acutely sensitive. The fissure can be seen by separating the folds of the anus, although this procedure usually gives rise to considerable pain. Defæcation in these cases is accompanied by great suffering, and the pain lasts for a considerable time after each action of the bowels. The account of the pathology of fissure and ulcer of the anus, which is usually given as applicable to all cases, holds good, in my opinion, for this variety of fissure only. From one of the above-mentioned causes an abrasion of the mucous membrane of the anal outlet results. This is subjected to continual irritation, reflex spasm of the sphincter muscles is set up, hea_ing is prevented, and consequently

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the case becomes chronic. Cure can only be effected by giving rest to the parts for a short period, so that the fissure can take on a healthy healing action.

(2) The second variety of fissure is situated, or, at all events, begins, at the upper part of the anal canal, and is due to laceration of one of the anal valves. The laceration takes place in most cases from the valve being forced downwards and torn during the passage of fæces. As a result of this, a small raw surface is produced, healing is prevented by the re-opening of the tear at each action of the bowels, and a small ulcer is formed. The ulcer may be round or triangular in shape; in some cases I have noted that it was distinctly V-shaped. The torn-down valve becomes œdematous and hypertrophied, and gives rise to the "sentinel pile," which so often accompanies fissure of the anus. The tear gradually extends downwards along the anal canal, and in old-standing cases may approach or even reach the muco-cutaneous junction. Under such circumstances the hypertrophied valve protrudes from the anus, and the ulcer can be seen by separating the folds of the part. Usually, however, the introduction of a speculum is necessary before the ulcer can be brought into view. When the tear has extended for some distance along the anal canal, the upper part of the laceration will probably have healed, and hence the true seat of origin of the lesion is apt to be overlooked.

This account of the pathology of fissure was first advanced by Mr. Ball.* It is undoubtedly correct for many cases, but it probably does not hold good for so large a proportion as Mr. Ball supposes. The same writer figured a case in which a fissure, originating in this way, was accidentally discovered in the post-mortem room.

With regard to treatment, the former of these affections may in many recent cases be cured by touching the fissure with nitrate of silver. In more chronic cases it will usually be necessary to place the patient under an anæsthetic, and to incise the base of the fissure and the underlying fibres of the external sphincter. Simple dilatation of the sphincter muscles sometimes succeeds, but is not altogether reliable.

In cases due to laceration of one of the anal valves, the sphincter should be well dilated, and then the hypertrophied mass formed by the torn-down valve should be cut away, so that nothing is left for the fæces to catch upon when the bowels are moved. It is well at the same time to freshen the surface of the ulcer by gently scraping with a Volkmann's spoon. In these cases it is usually unnecessary to divide the fibres of the sphincter muscle.

* *British Medical Journal*, 1891, Vol. I., pp. 583—585.

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CHRONICLE.

Medicine.

UNDER THE CHARGE OF JULIUS DRESCHFELD, M.D., F.R.C.P.

BARKER (L.). "The anatomy and physiology of the nervous system, and its constituent neurones as revealed by recent investigations."—*New York Medical Journal*, May 15, 22; June 19, 26; Sep. 18; Nov. 27, 1897; Jan. 22, 1898.

THE author commences this useful review by briefly referring to the older notions respecting the cells and fibres of the nervous system, and then proceeds to point out the additions which have been made to our knowledge in recent years.

The advances made by Golgi are first considered. In the method of staining worked out by him, the fresh tissues are placed in a solution of bichromate of potash, and then treated with nitrate of silver.* The nerve cells and their processes stain intensely black, and stand out prominently on the white or yellow ground.

By the application of this method Golgi recognises two types of nerve cells. The cells of the first type are characterised by branched protoplasmic processes (usually multiple) and a single axis cylinder process. But Golgi denied that the axis cylinder process was unbranched, as had been previously held; he discovered "side branches" upon the axis cylinder processes of the nerve cells. In the second type of cell, the axis cylinder begins to divide almost immediately after its departure from its cell of origin, breaking up into a large number of fine branches.

The most important advances made by Golgi were—(1) The invention of the silver method of staining; (2) the recognition within the central regions of the cells of the different types above mentioned; and (3) the discovery of lateral branches from the axis cylinder processes.

His and Forel first put forth evidence against the old view of diffuse nerve networks, and maintained the independence of individual nerve elements.

His concludes from his observation, that in the early stages of development of nerve cells there is no anastomosis between the different processes of a single nerve element, nor could he make out,

* The details of this method are now described in the ordinary text books of pathological history.

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in the later developmental periods, any evidence of fusion of the processes of one cell with those of another. His, therefore, opposes the view of diffuse nerve networks.

Forel soon afterwards protested against the theory of a nervous network; he maintained the individuality of the nerve elements, and for the first time, stated clearly the principle of contact, as an explanation of the correlations of nerve cells and their processes within the grey matter.

Soon afterwards Ramón y Cajal published his important observations. His investigations resulted in—(1) The demonstration (apparently definite) of the complete independence of at least the majority of nerve elements, the branches of the axis cylinders forming anastomoses no more than those of the dendrites; (2) the appreciation of the widespread occurrence and significance of the lateral branches (collaterals) of the axis cylinder processes; and (3) the demonstration of the striking uniformity in general structure of the majority of the nerve elements in all parts, despite multiple minor morphological variations. Ramón y Cajal maintained that "in the cerebro spinal nervous system the axis cylinder processes and their lateral branches, belonging to no matter what nerve cell, always ran out to end free within the grey matter. They often entered into close proximity to other nerve cells and interlaced with their protoplasmic processes; but nowhere could any evidence be found of actual union—the interrelation of the nerve elements depended entirely upon contact or contiguity, not upon organic connection. This was proved to be true not only of embryonic structures, but also of the tissues of the adult."

Cajal made a special study of the side fibrils discovered by Golgi upon some of the axis cylinder processes. He found a considerable number of fine collateral branches coming off from the axis cylinders of the white fasciculi of the cord in the embryo chicken. These collateral branches penetrated deeply into the grey matter of the cord and terminated in free end arborization, among the nerve cells and their protoplasmic processes. In preparations of the dorsal spinal nerve roots of the chick, he found that inside the cord, the axis cylinder undergoes a distinct Y-shaped division into two strong terminal branches, one ascending, the other descending, but both soon assuming a longitudinal direction. Fine collateral branchings could be seen coming off not only from the main axis cylinder, but also from its two branches of division at different levels.

Cajal found that the majority of the medullated fibres passing from the dorsal fasciculi into the grey substance (fibres which are seen so well in sections of the cord stained according to Weigert's method) do not represent main axis cylinders at all, but are collateral branches.

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They are structures of enormous importance, a large portion of them representing the most direct path of nerve communication between the sensory surface of the body and the ventral horn cells governing the voluntary muscles. We find in the fibres with their subdivisions and collaterals, given off at different levels of the cord and medulla, the anatomical mechanism concerned in the simple and more complex reflexes, "and thus we have not far to go to find the explanation of the well known fact, that the same sensory impulses which permit consciousness to be affected also account for the setting free of reflexes."

Ramón y Cajal showed that the only difference between the cells of type I. and type II., described by Golgi, was the length and mode of branching of the axis cylinder. Whereas that of the first type first showed an end arborization at a considerable distance from the cell, that of the second type broke up almost immediately after leaving its cell origin into its terminal filaments.

The views of Golgi and Cajal received support by a new method of staining discovered by Ehrlich. He found that by the injection *intra vitam* of a solution of methylene blue dissolved in salt solution into the blood vessels of an animal, the axis cylinders of many of the nerve fibres, as well as numerous (particularly sensory) nerve endings, were stained of an intense blue colour, when exposed to the air; whilst the other tissue elements remained unaffected or only slightly tinted. But the staining gradually faded.

It was soon shown by Arnstein that injection *intra vitam* was unnecessary, and he demonstrated that as long as the tissues remained alive injection into the dead animal gave results equally good. Also, sections of tissues cut with a Valentine's knife soon after removal from the body, and placed in a weak solution of the dye, stain beautifully.

Even with Golgi's stain, every nerve element cannot be followed throughout its whole length. Indeed, it is perhaps the rule that where the medullary sheath begins the silver impregnation of the axis cylinder process ceases. The staining of nerve endings in adult structures, according to Golgi's method, succeeds only rarely; but here lies the value of Ehrlich's methylene blue method. With a little care the nerve endings and axis cylinders can be stained very beautifully.

In 1891, Waldeyer did great service to the new conceptions by bringing together, within a brief compass, the results obtained, and he introduced the term "neuron" for the histological unit in the nervous system, *i.e.*, the cell body, protoplasmic processes, axis cylinder processes, and arborization collaterals.

Briefly stated, "the nervous system, aside from its neuroglia, blood vessels, and lymphatics, consists of an enormous number of individual

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elements, or neurones. Each neurone, in its entirety, represents a single body cell. These units are from the first, and continue throughout life to be, morphologically, and hence necessarily, in a sense, physiologically, independent of one another, the cell bodies or processes of the neurones never coming into connection with one another, except by contact or contiguity. There is no evidence of the existence of a diffuse nerve network. The axis cylinder of every nerve fibre, just as every protoplasmic process, is an integral part of a neurone, and has an organic connection somewhere with a nerve cell."

The Neurone as a Morphological Unit.—Neurones are then in reality nothing more nor less than cells curiously modified, and every portion of a neurone represents an integral part of a single body cell.

The external morphology of the neurone is best revealed by the methods of Golgi and Ehrlich; the internal structure by the method of Nissl. The cells of certain regions can be recognised by their shape, size, and variety of processes, as, for example, the cells of the spinal ganglia, the cells of Purkinje in the cerebellum, the pyramidal cells of the cerebral cortex.

There are two main varieties of processes which come off from the cell body—the protoplasmic and the axis cylinder processes. In appearance the former resemble more closely the cell body itself. These protoplasmic processes have been termed dendrites by His. They run out often in several directions from the general mass of protoplasm of the cell body. Broad and thick perhaps at their origin, they gradually grow more narrow, and divide. All the subdivisions of a single dendrite finally run out to end free, never, so far as our present knowledge goes (with the exception of a few rare instances), anastomosing with one another, nor becoming united in any way other than by simple contact with the processes of other neurones.

The axis cylinder processes, or axones of nerve cells, differ markedly in many ways from the dendrites. In the adult the axone comes off from the cell body or from a dendrite; in the latter case, usually near the cell body, though sometimes at a long distance from it. Unlike the dendrite, the calibre of the axone is, as a rule, maintained for a considerable distance from the cell. The surface of the axone is smooth, its contour regular, and its course, as a rule, direct, so that in most instances, the trained eye can recognise it at once, standing out sharply like a piece of black thread on a white or yellowish ground.

The length of the axone is variable. The total length may be only a few millimetres or even a fraction of one millimetre. On the other hand, the axones of some of the motor neurones are fully half as long as the height of a man.

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The neurones with long axones as a rule possess only one axone, but there are also neurones which possess several.

The ultimate terminals (telodendrions) of the axones have been carefully studied, and nearly all observers agree that every axone invariably ends "free." The termination of a branch of an axone by means of a definite end arborization about a single cell occurs, though not so frequently as many writers would lead one to think. The common mode of ending is by exhaustion through multiple division, this division being often spread over quite a wide domain, so that the terminal branches of a single axone not infrequently come into the neighbourhood of the dendrites and cell bodies of a considerable number of different neurones.

The intimate interweaving of the terminal axone exclusively with the dendrites of a second neurone very rarely occurs, except in a few localities.

The accessory branchings (mentioned above) of the axis cylinders or axones (the collaterals) are of importance. Von Lenhossék has never been able to find collaterals in the columns of Goll in the human spinal cord.

The collaterals are often, perhaps generally, medullated, and an immense number of the very fine fibres revealed by Weigert's method within the grey matter of the central nervous system represent medullated collaterals. The majority of fibres passing in from the dorsal columns of the cord are collaterals and not main branches of dorsal nerve roots. The collaterals, like the terminal axones, end "free."

The closer the analysis, the more certain and distinct becomes the view of the morphological independence of nerve units.

Internal Structure of Nerve Cells.—Max Schultze and others, many years ago, described a fibrillary appearance of the whole nerve cell and of the axis cylinder process. The internal structure of nerve cells has been the subject of much discussion, but considerable light has been thrown on the question by the method of staining with methyline blue introduced by Nissl.*

By this method two, sometimes three constituents of the protoplasm may be distinguished.

(1) A portion which stains intensely blue—the stainable or visible part.

(2) The portion which remains unstained.

(3) In many cells pigmentary deposits.

The stainable portions in the nerve cells show a series of different forms; smaller and larger granuales of regular or irregular shape, groups of granules, and rows of granules can be made out.

* Details of this method are now given in the ordinary text-books of pathological histology.

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Of the larger bodies three varieties are noteworthy :—

(*a*) The so-called nuclear caps—stained masses which possess the form of regular, sometimes irregular cones, each hollowed out internally like a cap, corresponding to one side of the nucleus upon which it sits. There may be two, occasionally three, within one cell.

(*b*) So-called wedges of division—stainable masses which fill completely the angle at the point of division of a nerve cell process.

(*c*) Spindles—oblong or spindle-shaped stainable masses which are thick in the middle, and become thinner towards the end, and occasionally run out into thread-like forms.

Nissl has carefully studied the internal structure of nerve cells as revealed by his method, and has made out different types or varieties. He thinks all nerve cells can be divided into two main classes. The first group includes the nerve cells which possess a well marked cell body, which surrounds the nucleus completely on all sides. The protoplasm has a distinct contour. These cells Nissl terms the *somatochrome* nerve cells. In the second group of cells the nucleus is most in evidence; the nucleus has a clear contour, but only indications, as it were, of the cell body are present, an appearance due to scanty development of the cell body, or to the predominance in it of the unstainable substance. Those cells in which the nucleus does not exceed in size the nucleus of a neuroglia cell or of an ordinary leucocyte he terms *cytochrome* nerve cells. Those cells in which the nucleus is of the size of that of an ordinary nerve cell, at any rate larger than that of a neuroglia cell, he terms *karyochrome* cells. Sub-varieties of the groups are also described, the arrangement of the stainable portion of the protoplasm being the basis of the classification. But for a detailed account the reader is referred to Barker's paper.

A most useful and important modification of the Nissl stain has been introduced by Held. [A full account of this method has been already given by Dr. Warrington in the MEDICAL CHRONICLE, Vol. V. (New Series), 1896, p. 402.

Held found that his method of staining demonstrated that the so-called Nissl's bodies presented an exquisitely granular structure.

Barker concludes his series of articles with the following summary: "A neurone is made up like all other cells, of nucleus and protoplasm. . . . The protoplasmic portion of the cell can be roughly divided into a peripheral exoplasmic portion and a central endoplasmic portion. In neurones, as in muscle cells, though less distinct in the former than in the latter, there is a tendency to a fibrillary structure, the fibrillæ tending to occur in the peripheral exoplasmic portion of both nerve and muscle cells rather than in the endoplasmic portion of the protoplasm. In both exoplasm and endoplasm there can be made out, in tissues which

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have been fixed, a more or less homogeneous ground substance, in which are deposited larger and smaller masses of a granular nature. The ground substance corresponds in tissues fixed with alcohol and stained by the methods of Nissl and Held to the 'unstainable substance' of Nissl, and the masses of granules to the 'stainable substance' of Nissl and the pigment.

"The 'stainable substance' of Nissl in healthy animals of the same age and species, with the same method of fixing and staining, is tolerably constant in appearance and arrangement in the cell bodies and dendrites of the same group of nerve cells, a fact of extreme importance for nerve anatomy and pathology. The axones appear to be entirely devoid of the stainable substance of Nissl." *R. T. Williamson.*

Surgery.

UNDER THE CHARGE OF THOMAS JONES, M.B., B.S., F.R.C.S.

BRYANT (JOSEPH D.). "Notes on appendicitis, with report of interesting cases."—*Medical News*, March 5, 1898.

THE author draws attention to some unusual cases of appendicitis, illustrating the difficulties in the diagnosis of this condition.

He first refers to a class of cases of chronic appendicitis characterised by abundant fibrinous exudation. In one of the five cases cited by Professor Bryant there was a history of repeated attacks of acute pain in the right side of the abdomen, attended with rapid increase of temperature and inguinal tenderness. At the time of observation a large, irregular, and immovable tumour was present in the iliac fossa, characterised by moderate tenderness and marked induration. The tumour had been present for several months, and had increased in size and tenderness after each acute attack, slowly resuming, however, somewhat smaller dimensions during the intervals. Chronic appendicitis was suspected, and an operation was advised in the event of another attack. Subsequently the operation was performed, and a large mass of induration was found below the cæcum, into which an opening was made in the unsuccessful search for the appendix. Finally, the wound was lightly packed with gauze. It rapidly healed, and the induration entirely disappeared. No further trouble occurred during the year or so that the patient remained under observation.

In another case, not only was there an enormous amount of long-standing induration, but also local and constitutional evidences of recent suppuration. A free incision was made into the abscess, pus evacuated,

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and the abscess cavity lightly packed with gauze. It was advised in this case that the appendix be removed by an independent operation as soon as the induration had disappeared, which was accordingly done, with entire success.

In another case, the patient, an artisan, of about 30 years of age, had undergone (about six months before coming to Professor Bryant) an exploratory operation upon what was thought might be an appendicular abscess. On exposure of the tumour it was regarded as an inoperable sarcoma of the cæcum, and the wound was closed. Although the tumour diminished somewhat in size after operation, the idea of malignancy was not relinquished. Whilst under observation it was observed that the size and tenderness of the tumour varied from time to time, in unison with the temperature fluctuations, and especially was this true when there had been much pain at the seat of the growth. These incidents, together with the past history, and the fact that the tumour had diminished in size after the first operation, and was no larger now than at that time, caused the author to exclude malignant disease as an element in the diagnosis, and to express a positive belief that the case was one of chronic fibrinous appendicitis.

"An incision made along the line of the previous operation freely and promptly exposed the tumour. It involved the lower half of the cæcum, and extended down nearly to Poupart's ligament, filling almost the entire iliac fossa. The tumour was hard and immovable. It was puzzling at first to fix upon a plan of exploration of the growth, as one did not care to incise it, fearing to cut the cæcum. The fibrous band of the colon, commonly leading to the origin of the appendix, disappeared in the indurated mass, which could not be separated from the cæcum without tearing away the serous covering, and thus laying the foundation for sloughing of the wall of that viscus.

"After a little hesitation, the sharp end of an ordinary periosteotome was introduced into the growth, in the line of the fibrous band before noted, and the growth prised open, thus dividing it into two parts of about equal size, united below by the deeper tissues. At the line of separation the base of the appendix was seen extending indefinitely downward and inward into the mass. By the careful use of scissors and the patient application of the grooved director, a complete appendix, about four inches in length, and very much thinned at the lower end, was withdrawn from the indurated mass. No other evidences of inflammatory action than thickening of the appendix and moderate circumscribed congestion of the contiguous peritoneum were found outside of the appendix, save the mass already mentioned. The appendix was removed, the main portion of the wound closed, and gauze drainage established. The patient made an uneventful and complete recovery, and when last heard

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from was entirely well. The appendix was microscopically examined, and pronounced to be chronically inflamed throughout its entire structure, with muco-pus at the end, confined by the thinned walls of the appendix and a stricture of the lumen above."

In another case of chronic appendicitis, with fibro-plastic induration, malarial symptoms came on—chills, followed by sweating, and high temperature. Quinine, in suitable doses, promptly reduced the temperature to 100°F., and the tumour began to rapidly disappear, and most of the previous symptoms vanished also. But, as the patient wished the appendix removed, and Professor Bryant considered the step desirable, an operation was performed. No induration was found, and the appendix was intact, but contained an enterolith, the size of a bean, lodged near the middle and bathed in muco-purulent fluid. The patient made an uneventful recovery.

Professor Bryant makes the following suggestions as an outcome of his study of these cases: "(1) That an enormous deposit of lymph may be the only product of some forms of appendicitis; (2) that even though repeated attacks occur, suppuration is not a common complication of this condition; (3) that free incision of the mass, attended by light packing with gauze, is followed by rapid absorption of the induration, and often by cure; (4) that suppuration may occur; therefore, the appendix should be at once removed, if practicable; if not, as soon thereafter as possible; (5) that chronic inflammation of the appendix, with fluctuation of a mild degree, provokes a response of apparently similar nature in the surrounding fibrinous mass; (6) that fibrinous induration, due to chronic appendicitis, may be mistaken for sarcoma of the cæcum; (7) that the influence of malaria may stimulate the fibrinous variety of chronic appendicitis, and that possibly the symptoms may be dispelled by the use of quinine."

The author further details some miscellaneous cases of interest. One of these was a young man, presenting characteristic, but mild, symptoms of appendicitis. The patient objected to operation, and, as the symptoms had ameliorated, it was decided to defer operation unless the condition became more serious. On the following morning the symptoms had increased in severity, and at nine o'clock the patient was admitted into St. Vincent's Hospital. The pulse was 99; temperature, 99° F.; tenderness and tension slight, and an entire absence of appreciable tumour. However, the patient was anxious, and vehemently urged an operation. Slight capillary paresis was noted, and an indefinite sense of nausea was present. For reasons unnecessary to mention, operation could not be performed within the next four hours. Nevertheless, it was done as promptly as possible, and at the time the pulse had arisen to 120 and the temperature to 104° F.

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A dusky surface of the body at this time was plainly evident, and the patient's anxiety had markedly increased. Operation revealed the presence of a gangrenous appendix, 4½ inches long, which was removed with some difficulty on account of its great length and the existence of firm adhesions at its upper end. On removal, the middle half was found to be completely gangrenous, but in no case had perforation occurred. A greyish, offensive, and watery fluid was present around the site of the organ; little evidence of limiting adhesions was found. The wound was cleansed, dressed lightly with gauze, and the patient put to bed. In spite of all effort he died within twenty-four hours from the effects of the profound sepsis established prior to the operation.

In this case there must have been gangrene of the appendix when the patient was first seen, but the history of the case did not at all suggest the acuteness of the impending danger. In appendicitis a comparatively rapid pulse, with a low temperature, is an ominous manifestation. The character of the pulse is of greater significance in these cases at the outset than is that of the temperature.

In another case, in a hysterical female, persistent and annoying pain in the pelvic, right inguinal, and lumbar regions had led to the removal of the left ovary and the operation of right nephrorrhaphy. Careful palpation led to the opinion that the appendix was diseased. It was removed, and mild chronic inflammation of its walls and beginning gangrene of the lining membrane, at the site of a small enterolith, were found, thus justifying the operation. Nevertheless, the pain continued the same as before.

In 1896, Professor Bryant saw a young woman, who complained of moderate pain and limited tenderness on deep pressure at the seat of the appendix. The pulse was normal, but the temperature was slightly and continuously elevated. Removal of the appendix was proposed, but declined by the patient, who, however, returned the following year anxious for prompt operation. There had been two or three light attacks during the interval. At this time the point of tenderness was well marked, and a small, tender tumour was made out. At the operation no evidence of inflammation could be found, and no trace of the presence of an appendix. A small tumour was found in the posterior wall of the cæcum, in the line of the common origin of the appendix. This growth was the deep-seated tender point which was mistaken for a diseased appendix.

Hare (H. A.). "Some instructive cases of appendicitis."—*The Medical News*, March 12, 1898.

In this paper Professor Hare details seven cases of appendicitis coming under his observation. In the first case the patient had had acute

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appendicitis nine times, with surrounding exudation and a chronic inflammatory process between the attacks. Operation was urged, and was performed during a period of quiescence. The appendix was found greatly enlarged and surrounded by a mass of exudate, which was removed with some difficulty. The operation was well borne, but within twenty-four hours nausea and stercoraceous vomiting ensued, and the patient died. Professor Hare still thinks the advice to have an operation performed was theoretically good, but practically the man would have lived longer if he had not consented to the operation.

In case 2, a man of 55 had two attacks of acute appendicitis at intervals of six months. He was willing to have an operation performed if recurrence were probable. Professor Hare advised against it, and for four years the patient has been well, with no sign of a third attack.

In cases 3 and 4, also, operation was not performed, but the patients were treated by rest, along with local and general treatment. In case 4 there has been no recurrence since June, 1895.

In case 5, a woman, aged 33 years, had four attacks of appendicitis in four and a half months. Operation had been repeatedly refused, but on the occasion of the last attack the symptoms were so serious that an operation was insisted on. An abscess was found at the tip of the appendix, containing about one drachm of pus. The abscess was ruptured during removal of the appendix. The wound was, however, carefully cleansed and all pus apparently removed. After a fortnight the temperature began to rise and became intermittent. The wound was twice opened, and found quite healthy. Ultimately the patient died, and post mortem a large abscess of the right ovary and tube was found, from which general peritonitis had resulted. Infection had evidently occurred from the ruptured appendix.

In case 6, a man, aged 40 years, was seized in the night by excruciating pain in the groin and throughout the whole abdomen. When seen, six hours later, the abdomen was already swollen and rigid, and exquisitely tender. The pulse was rapid, but otherwise good. Operation was insisted on, and performed within an hour. The appendix was found gangrenous at its tip. Recovery promptly followed.

In case 7, a boy of ten years of age, ten days after removal of the appendix, violent pain in the abdomen came on, and symptoms of intestinal obstruction. After copious intestinal irrigation had been tried unsuccessfully, a second operation was performed, and two large knuckles of gut found adherent to the abdominal wall, producing obstruction. After four or five days, further evidences of obstruction appeared, but after repeated rectal injections a large amount of fæcal matter was passed, and the symptoms subsided, leaving, however, partial paraplegia.

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Professor Hare makes the following comments:—

"These cases, which are taken as types from a larger series, illustrate the fact that the physician assumes a grave responsibility if he urges an operation, perhaps as grave as if he opposes it; that he cannot afford to leave a decision as to the wisdom of operation entirely to his surgical colleague, and, finally, that patients with appendicitis often recover and remain well, or, in other words, in all cases an operation is not necessary, either for immediate relief or for the prevention of other attacks. On the other hand, there are cases which are so fulminating in character that an hour's delay is dangerous, and I am inclined to believe that in cases with early fixation of the body and abdominal muscles, and without much temperature disturbance, operation is more necessary than in those in which the pain is greater, more continuous, and more severe on pressure." *Francis J. H. Coutts.*

HARRIS (M. L.): Chicago. "Renal hæmaturia without known lesions." *Philadelphia Medical Record*, March 19, 1898.

Two cases observed by the author are here recorded. The patients were males, æt. 50 and 51, in whom constant hæmaturia had existed in one case for three months, in the other for three years. In neither case were any other symptoms present referable to the urinary tract. Examination of the kidneys, bladder, prostate, and urethra was entirely negative. The urine, dark brown in colour, was normal, except for the constant presence of blood. In one case (by cystoscopic examination of the bladder) the blood was seen to flow from the left ureter. In the other case no such examination is recorded. In the latter rest and hæmostatic remedies were employed for some weeks without benefit. The patient was then placed on general tonics with forced nourishment, and began to improve at once. In a few weeks the blood had disappeared from the urine; and there has been, after an interval of two and a half years, no recurrence. In the second case medical treatment proved ineffectual, and the kidney was explored. The pelvis was opened freely by an incision along the convex border, but no abnormality or lesion of the organ could be discovered. The kidney incision was sewn up and the wound closed. At the end of a week after the operation the hæmaturia ceased. Six months later there had been no recurrence.

Dr. Harris details 14 other published cases of persistent renal hæmaturia without perceptible lesion of the kidneys. Including his own cases, of the 16 patients 7 were males and 9 females, the ages ranging from 19 to 54. In all the cases the hæmaturia began without known cause during apparent health.

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Concerning the ætiology and pathology nothing definite can be said. More definite knowledge will probably lead to a further classification of these cases. Klemperer uses the term "angio-neurotic hæmaturia" for them. Against the influence of the nervous system is the statement that In all cases where the fact was determined (viz., in 14 out of 16 cases) one kidney only was affected. This points strongly to some local lesion.

As regards treatment, hæmostatic remedies have proved of no benefit. After a reasonable trial of tonic treatment nephrotomy should be performed. Of the cases here recorded, in 11 this was done. Of these one died. Of the 10 recoveries, 9 were completely relieved of the hæmaturia. In one in which the kidney was exposed, but not cut into, no relief followed. In 5 cases nephrectomy was done; one of these died. The four recoveries were all permanently relieved.

MOYNIHAN (B. G. A.). "A case of nephrectomy for ruptured kidney."—*Quarterly Medical Journal*, April, 1898.

THE patient, a boy of 10, slipping on a steep hill side, rolled down for some distance, until his fall was stopped by a large stone, with which his side came into violent contact. He walked one mile home, then vomited, and on passing urine it contained bright-coloured blood. The hæmaturia lasted two days; then no blood for four days, followed by its occurrence for two days. The quantity of blood then suddenly increased; in fact, almost pure blood was passed. Two days later there was profound anæmia. On examination slight fulness and sense of resistance in the right lumbar region was discovered. During the next 24 hours the condition grew worse, and exploration of the kidney was performed.

A large quantity of blood-clot was found under the fascia transversalis, and cleared out. The kidney was seen to be torn in two transversely, the tear extending into the commencement of the ureter; and nephrectomy was therefore performed. Recovery was uninterrupted, the urine increasing gradually in quantity from 20 to 50 ounces per diem.

Mr. Moynihan regards hæmaturia as a sign of very little use in determining the extent of the injury and as a guide to the probable issue of the case. The existence of a lumbar swelling is of much more importance, and, if it forms early and increases rapidly, there can be no doubt that exploration is promptly called for. In considering the chances of successful interference, statistics for 18 years collected by G. W. Spencer, show that in cases treated expectantly the mortality was 42·4 per cent; in those treated by early nephrectomy, 20 per cent; and in those by late nephrectomy, 38 per cent. Early nephrectomy was

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performed for hæmorrhage and shock, and late nephrectomy when septic changes had set in. Operation would thus appear to offer the best prospect. On this point Professor Keen is quoted as saying: "The great mass of recoveries in rupture of the kidney are the slighter cases; the graver ones do not recover unless an operation is undertaken."

Bérard (M. L.). and Gallois (M. E.). "Strangulated diaphragmatic hernia with rupture of the colon into the thoracic cavity."—*Lyon Médical*, February 13th, 1898.

The patient, a woman, aged 25, was admitted into hospital with a twelve days' history of intestinal obstruction; six days' complete obstruction and three days' vomiting. Examination revealed nothing definite. On account of the serious condition of the patient an immediate enterotomy was decided upon, and the cæcum was opened in the right iliac region. This was followed by a copious fæcal discharge, disappearance of the abdominal distension, and for two days there was great improvement. Then the patient suddenly collapsed, with a feeling of something rupturing and intense pain in the left side of the thorax. The physical signs of left pneumothorax, with some fluid at the base, were present. The same evening 100 grammes of fœtid fluid were removed, and 36 hours later an incision as for empyema was made in the ninth interspace. It was thought that an intestinal abscess had burst through the diaphragm, a true hernia not being suspected. The patient died thirteen days later, pain, dyspnœa, and cyanosis being the prominent symptoms, due to the congestion of the lungs and pneumonia of the right base.

Post-mortem examination showed that the descending colon and sigmoid flexure had passed into the thorax through an opening on the edge of the left lobe of the central tendon. The length of the prolapsed intestine was over three and a half feet. Rupture had occurred close to the foramen in the diaphragm, which was of the size of a five franc piece. Its edges were firmly adherent to the intestine and sigmoid mesocolon, passing through it.

The authors are of opinion that this was an acquired hernia, the orifice not being in the position of the deficiency found in congenital cases. There was no history of trauma in this case; the formation of the orifice was attributed to a sudden attack of violent pain in the left side, lasting four days, and coming on directly after labour 18 months previously.

The diagnosis of diaphragmatic hernia has very rarely been made during life, and in a case recorded by Schwartz and Rochard, the condition was not discovered, though laparotomy and careful examination of

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the abdominal cavity was performed. In two cases by Traumann, where the hernia was found, the intestine was fixed to the edge of the opening, and could not be reduced.

In those cases where a hernia occurs immediately after a wound of the diaphragm, the surgeon may intervene by the transpleural operation, and perform a radical cure by sewing up the rent in the muscle. Paolo reported to the Academy of Medicine of Rome, in 1890, seven successful cases, three of them operated on by himself. Apart from such cases, operated on before strangulation has occurred, any interference would appear to be of no avail. *J. W. Smith.*

Midwifery and Diseases of Women.

UNDER THE CHARGE OF W. J. SINCLAIR, M.A., M.D.

DE LEE (JOS. B.). "Asphyxia neonatorum: Causation and treatment." *Medicine*, August, 1897.

SCHULTZE estimates that five per cent of children are stillborn, dying during labour, and one and a half per cent die shortly after birth, the result of the trauma of labour.

Causes.—Too frequent and powerful labour pains prolonged, with short intervals of relaxation, are very dangerous to fœtal life.

Ergot lengthens the pains, lessens the intervals and increases the force of the uterine contraction, and the same dangers menace the fœtus when from too frequent manipulation or attempts at delivery the pains assume a tetanic character.

Premature separation of the normally implanted placenta may occur during pregnancy, and then is almost always fatal to the child. The death of the second twin in utero is often caused by too early separation of the common placenta.

Separation of the placenta, when it is prævia, causes asphyxia.

All those conditions which cause a compression of the cord obviously cause asphyxia, as when the cord is prolapsed or coiled round the neck of the child. In compression of the brain, when the head is being forced into a contracted pelvis by strong pains, or when the head is compressed by the blades of the forceps, a marked slowing of the pulse can be noted, due to irritation of the pneumogastric, and as a result of the slowed circulation the blood becomes venous, and asphyxia follows.

One of the first signs of danger is the decrease in the number of fœtal heart beats.

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In some cases there is an increase, usually coming on after diminution, though it may be primary.

Irregularity of the heart between the pains is also of significance, as is also impurity of the first sound.

The second diagnostic sign is the passage of meconium, brought about by peristaltis, caused by the venous state of the blood. Liquor amnii, stained with old meconium, is olive green in colour, appears more watery, and the meconium is thoroughly mixed with it. Fresh meconium is dark green, lumpy, and not thoroughly mixed with the liquor amnii.

One of the early signs of asphyxia may be undue violent movements of the child, felt by the mother and attendant. Another sign—and a serious one—is feeling, seeing, or hearing respiratory movements made by the child.

Treatment.—The bag of waters should not be ruptured unnecessarily. Ergot should not be given until the placenta is expelled. Watch the fœtal heart sounds carefully. When commencing asphyxia is diagnosed, deliver as rapidly as possible consistent with the safety of the mother. If the fœtal heart has ceased to beat embryotomy is to be performed.

In mild asphyxia the child is rigid, blue, with turgid lips, slight exophthalmos, makes a few attempts at respiration, but the mucus in the passages prevents the air from entering the alveoli. The heart beats strongly, and a finger introduced into the throat provokes a reaction.

In severe asphyxia, the child is limp, the surface is pale, the heart beats faintly, and the throat does not react to the finger.

There are three great principles governing the treatment of asphyxia neonatorum: First, maintain the body heat; second, free the air passages from obstruction; third, stimulate respiration or supply air to the lungs. The baby should be wrapped in warm towels or put in a warm bath.

In the mildest cases wipe the throat with the little finger covered with the corner of a soft towel. This also excites cough and mucus is expelled.

In the more severe cases the deeper passages must be cleared by means of a soft woven catheter open at the end, which is passed through the glottis into the trachea. A slight suck draws the contents of the trachea into the tube, it is withdrawn and the mucus blown out on a towel. This is repeated till the passages are clear. This may be supplemented by rubbing the back with a warm towel, or placing the child in a hot bath.

In the severest cases artificial respiration must be performed, and the author has obtained the best results from rhythmical compression of

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the chest, the Schultze swingings, and mouth to mouth insufflation with the tracheal catheter. Sylvester's method is also valuable. The Schultze swingings have proved the most satisfactory in the author's hands.

Asphyxiated children and children delivered by severe operative procedures should be watched for several days after birth, as secondary asphyxia is liable to follow from filling up of the lungs. They are also subject to icterus and sepsis.

BALDWIN (L. GRANT). "The early diagnosis of malignant uterine disease."—*Medical News*, March, 1898.

IF a case is seen when the disease is confined to the uterine tissue itself, a complete hysterectomy will add to the days and comfort of the patient, if it does not effect a permanent cure.

Unfortunately, cases are not often seen in the early stages, and the author states that of twenty-seven cases seen during the last eighteen months in hospital practice, twenty-four were beyond operative treatment.

Only too often symptoms at the menopause, which at other periods of life would be rigidly investigated, are put down as due to "the change of life."

The first step to an earlier diagnosis is education of the laity, with the view to destroy the idea that the menopause is an abnormal phenomenon, during which the sufferer may lose an enormous amount of blood every two to six weeks for a period ranging from six months to as many years. How this education is to be accomplished the author does not say.

The one sign of malignant disease that should be investigated, and especially when it occurs at or near the menopause, is hæmorrhage. In all cases the author has observed, bleeding has been the earliest symptom. In some cases bleeding after coitus occurs before any derangement of the menstrual flow is noticed.

Another comparatively early symptom is an intermenstrual, watery, irritating discharge, not necessarily foul smelling.

This, when the disease begins in the cervix, may precede any change in the amount or frequency of the menstrual flow.

In nearly all cases coming under observation at a sufficiently early period for total extirpation, to offer any reasonable hope of cure, for diagnostic purposes a preliminary scraping, followed by a microscopic examination of the material removed, will be required.

In conclusion, the author insists that all abnormal symptoms, occurring at the menopause, should be investigated.

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BALLERAY (G. H.). "The early diagnosis and treatment of extra-uterine pregnancy."—*Medical News*, January, 1898.

THE author gives the record of four cases in which he performed abdominal section. One was a case of double extra-uterine pregnancy, and was diagnosed before rupture. In the other three, rupture into the peritoneal cavity had occurred. There was one death.

In some cases the history is such as to create a strong presumption in favour of the presence of this condition. On the other hand, the history is often misleading, and in a large proportion of cases there is absolutely no history beyond the fact that the woman presented the usual symptoms of pregnancy. In the latter case, rupture of the sac is the first indication that anything abnormal exists.

All women during the child-bearing period are liable to the occurrence of extra-uterine pregnancy, but especially women who have been long sterile.

The typical symptoms are amenorrhœa of one, two, or three months' duration, followed by irregular discharge of blood from the vagina, recurrent colicky pains in the lower part of the abdomen, and the occasional discharge of portions of deciduous membrane.

Upon physical examination the uterus will be found enlarged if gestation has continued beyond the second month. Softness of the os is not always present. In multiparæ the os is sometimes patulous. On one side of the uterus, sometimes behind, a soft resilient mass can usually be detected.

Examination per rectum is of value.

The changes in the breasts, characteristic of pregnancy, may or may not be present.

Differential Diagnosis.—In retroflexion or lateroflexion of the gravid uterus the tumour behind or on one side of the cervix is continuous with it. In acute pyosalpinx and ovarian abscess, more or less constant pain and tenderness on pressure are present, accompanied by elevation of temperature.

In small myomata the body of the uterus is enlarged, but the menstrual flow is not suppressed.

Early pregnancy in the rudimentary horn of a malformed uterus cannot be differentiated from ectopic pregnancy; nor is it essential that it should be, as the treatment is operative in both.

While the use of the sound may be justifiable in certain cases, its indiscriminate employment cannot be too strongly deprecated.

The diagnosis after rupture of the gestation sac is based upon the evidences of the abdominal shock and concealed hæmorrhage.

The hæmorrhage is generally out of proportion to the development

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of the gestation sac; the earlier the rupture occurs the more rapidly fatal the hæmorrhage.

When rupture occurs between the layers of the broad ligament, the evidences of shock and hæmorrhage are rarely so marked as when it occurs into the peritoneal cavity. On physical examination, a large, soft, boggy mass is found on one side of and posterior to the uterus, displacing the uterus to the opposite side, the cervix being pushed under the pubes.

The treatment of extra-uterine pregnancy should be purely surgical.

Whether diagnosed before or after rupture, abdominal section should be performed, and the gestation sac removed.

Where intra-ligamentous rupture occurs no active treatment should be undertaken, the only exception to this rule being when suppuration of the hæmatoma follows, or secondary rupture into the peritoneal cavity occurs.

In the treatment of ectopic pregnancy abdominal section is preferred to the vaginal route, for it gives more room for work. The manipulations are performed under the guidance of sight as well as touch, and the cleansing of the peritoneal cavity can be more easily and effectually performed. *T. V. Cunliffe.*

Pharmacology and Therapeutics.

UNDER THE CHARGE OF D. J. LEECH, M.D., D.Sc., F.R.C.P.

INGRAHAM. "The successful treatment of pulmonary tuberculosis by the hypodermic use of a compound solution of iodine."—*New York Medical Journal*, October 23rd, 1897.

THE author alludes to the powerful action of iodine as an anti-tubercular remedy and to the drawbacks attending its administration by the mouth, especially as in most cases of phthisis the stomach is already in an irritable condition. As regards the hypodermic injection of iodine, the chief drawback is the extreme pain attending its use. In 1891 the author began some experiments with the view of overcoming this objection, of combining iodine with one or more remedial agents of recognised value in tuberculosis. After twelve months of experimental work a chemical product was obtained which contained no free iodine, and caused very little pain when administered hypodermically. This compound solution was then tried for five years in the treatment of all forms of phthisis with the most satisfactory result. It is prepared for

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hypodermic use only, sterilised oil being used as the solvent. Each drachm of the substance represents approximately the following :—

Iodine	(chemically pure)	.....	½ grain.
Bromine	„ „	.....	$\frac{1}{14}$ „
Phosphorus	„ „	.....	$\frac{1}{100}$ „
Thymol	„ „	.....	⅛ „
Menthol	„ „	.....	⅛ „

In character this compound is of a bright cherry red colour, transparent, and with a slightly aromatic odour. It keeps indefinitely without undergoing any change, if protected from light and heat. Its hypodermic administration is said to be attended with less pain than the hypodermic administration of morphine. In the *American Medico-Surgical Bulletin*, of 1895, the author reports fifty cases of pulmonary and laryngeal tuberculosis treated with this compound of iodine, and claims the following results :—(1) Nearly 90 per cent of cures in all cases of pulmonary tuberculosis, treated in the first stages of the disease ; (2) nearly 50 per cent of recoveries in the second stage of the disease.

The author quotes one case as showing the characteristic improvement after this treatment was commenced—increase in weight, diminution of expectoration, of the fever, night sweats, etc. Two and a half years later there had been no relapse, although the patient had followed out-door occupations which had exposed him to all conditions of severe weather. As a result of more than ten thousand injections the author finds that no local irritation follows, and suggests that the remedy may be of value in syphilis. *A. E. Brindley.*

Powell (Sir Douglas). "Lumleian lectures on the principles which govern the treatment in diseases and disorders of the heart."—*Lancet*, March 26, April 2, April 9, 1898.

The lecturer first describes the treatment of those modifications of cardiac functions due to disturbed innervation of the heart and vessels, which arise from toxic influences on the nerve supply or from reflex or direct excitation or depression of the heart ; the tissue of this organ itself being sound, or at least only altered from malnutrition, defective metabolism, morbid blood stream, or functional overstrain. A classification of these cardio-vascular neuroses is given, which is, however, wanting in clearness. Many people, especially young adults, whose heart's action is usually normal, suffer at times from undue appreciation of this action, which is liable to be paroxysmally excited and accelerated. Hence flutterings, throbbings, and flushings, with at times intermittent faintness. The pulse tension is variable, and the patients are usually neurotic, either from hereditary influence, from alcoholic, tobacco, or

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other excesses, or from mental overwork. In a second class the heart's action is really oppressed to a point varying from mere vague anxiety to a positive discomfort. This is more common from 30 to 50 years of age. The arterial tension is usually increased. In both vaso-motor angina may occur: for shock, emotion, and dyspeptic troubles, etc., may give rise to such arterial resistance as to cause cardiac embarrassment.

In dealing with the treatment of cardiac vascular neuroses, Sir Douglas Powell first draws attention to the importance of making an accurate diagnosis. If the patient can be truthfully assured that there is no organic lesion, a most important step is taken in treatment. An ill considered diagnosis of a weak or dilated heart may be the cause of grave evils, for the patient is thereby rendered unhealthily apprehensive.

The next point needing consideration is the patient's habits of life. The removal of the morning cup of strong tea, or its replacement by a small cup of milk diluted with Vichy water; the arrangement, by rising a little earlier for a leisurely breakfast, the avoidance of rush at the luncheon hour, and the securing of a quiet hour before dinner will often do much to render digestion more complete, and quiet the nervous system. Sometimes the work must be decreased. Social engagements, too, may have to be curtailed, but it is not wise to interfere too much with amusements and duties so as to spoil life. Too much interference encourages the introspective habit which it is most important to discourage. The restful régime of a spa suits some, whilst others are benefited by a sea voyage, but this should only be advised for those who can eat and sleep well on board ship. In all cases care in diet is required, and avoidance of any excess of alcohol, tobacco, tea, or coffee. Many people in the forties and fifties lose leisure for exercise owing to the pressure of business, and yet continue to possess their power of eating and drinking. Such people in addition to dietetic care must adopt steady daily exercise, for them the terrain cure of Oertel is advisable and a yearly course of the waters of Harrogate, Homburg, Carlsbad, etc.

The removal as far as possible of the exciting causes of cardiac disturbance is the third point requiring attention. A floating kidney may cause cardio-vascular excitement: so too may exostoses, bad teeth, and other sources of irritation, such as pulmonary, gastric, or uterine neuralgia. High tension must if possible be decreased by careful diet and exercise, and the administration of hepatic depleting medicines and salines. The amount of fluid taken with meals should be restricted to a claret glass of light wine or diluted spirit at luncheon, and two glasses at dinner. Between meals, a glass of plain hot water should be slowly sipped to supplement the fluids taken. The Oertel and Schott methods of treatment are specially well adapted to such cases. Drugs are often required in cardio-vascular neuroses: especially purgatives or

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laxatives, and occasionally mercurials to lower arterial tension and remove irritating materials. Bromides, too may be required and also arsenic and iron. Strychnine is badly borne by patients of the neurotic class, except for short periods, and where a cardiac tonic is required, caffein is more appropriate.

Sir Douglas Powell discusses the treatment of two symptoms occasionally presenting themselves in cardio-vascular neuroses. Acute breast pang or angina pectoris is, he holds, in a large proportion of cases an entirely functional disorder, originating outside the heart, chiefly from contraction of the peripheral and visceral vessels which acting on a disturbed heart leads to cardiac embarrassment owing to the sudden call upon one or both ventricles. In considering the treatment of angina he alludes to both unhealthy and healthy hearts. There is no difference except in degree between angina of a sound and unsound heart, but there is every difference in the gravity of the prognosis, for in the one there is no danger of death, in the other grave danger. In angina with a sound heart, the object of treatment is to relieve suffering. Sir Douglas Powell, however, recommends the nitro-compounds, and especially one minim of the 1 per cent solution of nitroglycerine at intervals of five minutes for 2, 3, or 5 doses: at the same time, a cardiac stimulant should be given, but alcohol should be avoided. Slow sipping of hot water and hot drinks is useful; so, too, is a carminative draught. Warmth should be applied to the extremities. After the attacks there is sometimes some excitement followed by fatigue, the heart becoming quick and irregular. Rest is very necessary.

Where there is valvular or renal disease, or evidence of cardiac degeneration, the initial treatment must be started with inhalation of nitrite of amyl. The attack is often attended by acute heart failure, so that clinical features of high-pressure pulse and labouring heart may be immediately lost. The subcutaneous injection of pure ether, to which a minim of nitroglycerine may be added, is the best treatment in severe cases if caught at the right moment. The sense of prostration is greater in these cases, and alcoholic stimulants, which are to be avoided in pure vaso-motor cases, are in these cases imperative. Here, too, a carminative draught is of much service. There is a tendency to a series of attacks, and it is well to give strychnine or caffein with digitalis. Oxygen inhalation is a powerful restorative to the fatigued heart and may be given every five or ten minutes for an hour or so.

Concerning the treatment of the second symptom sometimes found in the cardio-vascular neuroses, tachycardia, it is stated that no successful direct means of treatment has been found.

The digitalis class of drugs are useless in these, as in almost all cardiac neuroses, except in the treatment of the heart fatigue which

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sooner or later ensues. In the treatment of the rapid heart action accompanying exophthalmic goître, the only possible method of alleviation is absolute rest for six months in bed, or on the sofa or couch in the open air, with the avoidance of excitement and mental fatigue, and during the next two to five years avoidance of all fatigue. The thymus extract is of some value in diminishing the rapidity of the pulse. The galvanic current has been found useful in some cases. Operative treatment has been followed by very inadequate success.

Bradycardia sometimes follows on the rapid beating of the heart in exophthalmic goître, and is commonly associated with myxœdema. As a temporary condition it is not an infrequent sequela of influenza. Strychnine and potassium iodide are often useful, and caffein is advisable where the urine is scanty.

The second lecture is devoted to acute inflammatory diseases of the heart and valvular disease.

Great stress is laid on the supreme importance of absolute rest in bed in the prevention as well as in the treatment of rheumatic endocarditis. Dr. Sibson has pointed out that the difference between absolute and incomplete rest in the treatment of acute rheumatism is an exemption from heart complication in 71 per cent contrasted with 44 per cent. Of 24 cases of rheumatic fever with absolute rest only 1 had aortic disease, whilst 19 out of 127 suffered from it where rest was not complete. The lecturer is of opinion that salicylate of soda materially lessens the liability to endocarditis in acute rheumatism. When it has set in, alkalies and salicylate of soda should be given. Local treatment, whether by blisters, leeches, by cold or by warmth, seems to have little influence.

Digitalis is useless in acute inflammatory heart affections, and aconite, with certain exceptions, is harmful. In peri- and myocarditis, especially where there is pain and irregular rhythm, and a tendency to tumultuous action and heart failure, small doses of opium at frequent intervals are of great service; they calm irritation and restlessness, and secure more heart rest.

When the acute stage passes away, arsenic, strychnine, and iron are useful; 5 grain doses of mixed iodide of potassium of soda and ammonia, three times a day, seem to be of some advantage in helping the resolutions of the inflammatory thickenings. If there be quick or irregular cardiac rhythm, digitalis (20 to 30 minims dailv) may be given, but not if this be due to inflammatory irritation. This is indicated by a raised temperature, with a soft, low-pitched murmur. Perfect sanitation during treatment is very desirable in connection with the possibility of ulcerative endocarditis, and in convalescence the seaside is preferable to the country. The general nutrition must, of course, be maintained, and judicious massage is advisable.

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In discussing the value of digitalis, the lecturer remarks that clinically, digitalis seems to affect the heart before the vessels, though experimentally, in full physiological doses, the vessels have been found to re-act sooner than the heart. Evil influence from a contracting effect on the blood vessels by the drug is rarely to be found. In its use it must be remembered that each form of valvular disease has its own type of pulse, and the digitalis should be given to maintain this type. In aortic regurgitation, for example, we give it when an irregularly feeble pulse and right heart embarrassment give evidence of ventricular failure; when, however, there is reason to believe that the ventricle is only overworked, owing to contraction of the peripheral vessels, as in gouty conditions, mercurials and salines, followed by tonics, are more useful than digitalis. It is never necessary to lessen the work of the hypertrophied heart by aconite. In cases of aortic incompetence the lecturer recommends 30 to 90 minims of tincture of digitalis, three times daily. The recumbent position should be maintained. In aortic stenosis digitalis is of use only when there is evidence of cardiac failure. It is well to give occasional courses of digitalis afterwards. In mitral stenosis digitalis in early stages might possibly cause constriction of the arteries and do harm. When there is cardiac distress, due to dilated right heart, the first indication is to unload the venous system by intestinal or hepatic derivatives, a restricted diet, and the treatment of pulmonary complications. But if the pulse remain quick or irregular after such treatment digitalis is called for.

In mitral regurgitation the pulse is naturally small and quick. This condition, however, does not call for digitalis, though short courses may occasionally be useful. It is the irregularity of the pulse, a few large beats followed by several small beats, with evidence of dilated ventricle and failing urine excretion, which makes its use imperative. It is a mistake to give digitalis in too large doses at first; physiological symptoms are apt to show themselves early, and the drug has to be stopped. Its effects should be gradually developed.

In an ordinary case 10 minims should be given every four hours, or 15 every eight or five every waking hour. Thus given it is about three days before the pulse is controlled, and the urine increased. The drug may be steadily continued until the pulse gives warning of excess of the drug by becoming slow, and showing small intermediate beats, and a tendency to beat in couples. Then the dose should be reduced or omitted for a few hours. The sickness which occasionally supervenes on digitalis may be sometimes prevented by occasional mercurials. A tumbler of hot water, taken at intervals, may be at times given with advantage.

With regard to the efficiency of the several members of the digitalis group, Sir Douglas Powell thinks that digitalis is useful in front of all

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others, that he would not think of prescribing any other member before it. He is not well satisfied with strophanthus, and doubts its stability when prescribed in the ordinary way. He thinks the two drugs may be well combined when it seems possible that harm might arise from contracting the vessels too much. Convallaria may be useful in mild cases. The withdrawal of fluid by Southey's trochars should be undertaken, it is said, when it is estimated that the pressure of fluid in the cellular tissues has become greater than, or equal to, the pressure in the capillaries. But the data of such estimation are not given. By whatever means fluid is drawn from the lower extremities strict antiseptic precautions must be employed in their use.

In the third lecture the treatment of heart failure and pericarditis is discussed. The acute heart failure in the later stage of pneumonia is especially alluded to. The running pulse, irregular from loss of vagus control, and soon followed by evidence of œdema of the unconsolidated portions of the lungs, and tracheal rattle, are the signs of heart failure. There are two symptoms which especially tend to heart failure, viz., a temperature of above 104° and sleeplessness. The failure often comes on suddenly. At the very commencement of such signs, ammonia, which may have been usefully given for a few days, tends, the lecturer says, to produce cardiac depression, and should be changed for a mineral acid, of which phosphoric acid is the best. It would be interesting to know the exact grounds for the views with regard to the depressing action of ammonia and the use of phosphoric acid. Digitalis or strophanthus should be given, and strychnine, too, either with an extra quantity of stimulant or subcutaneously; but the most powerful remedial agent is oxygen, since it secures a supply of oxygenised blood to the coronary arteries, and the pulse becomes slower and fuller under its use. It should be given in good time as an occasional inhalation. The temperature should be reduced by cold or hot sponging. For sleeplessness, 10 or 20 grains of sulphonal, taken in hot fluid at 8 or 9 p.m., with a 20-grain dose of bromide at 10-30, is often sufficient. When the temperature is high, a single dose of 7 to 10 grains of phenacetin may be added to the bromide. When delirium is marked, hyoscin in doses of $\frac{1}{200}$ of a grain subcutaneously, repeated once or twice, may be used sometimes with great advantage. Cases of persistent sleeplessness almost invariably prove fatal. When bromides, chloral and sulphonal, seem useless, morphia should be given to secure a few hours' sleep ($\frac{1}{3}$ grain of morphia with atropine). Food and stimulants should be administered, and oxygen inhaled. Strychnine, the lecturer thinks, tends to favour the sleeplessness of patients when utterly exhausted. But its power as a cardiac stimulant is unrivalled. Attention is drawn to the great value of oxygen inhalation in the treatment of heart failure in old people, due

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to fatty degeneration. Inhalations of oxygen, too, are likewise useful in Cheyne-Stokes' breathing, which is apt to supervene in some forms of cardiac disease after fatigue, and to come on during sleep.

In dealing with the treatment of ulcerative endocarditis, the lecturer first points out the great importance of prophylaxis. Patients convalescent from rheumatic endocarditis should be carefully protected from insanitary conditions. Arsenic is the only drug under which he has seen a patient get well. He has seen no good results from quinine, sulpho-carbolates, guaiacol, mercury, etc.

Four cases have been recently recorded, treated by anti-streptococcic serum, of which three recovered.

But a table is given of all the cases that could be collected, from which it would appear that out of 12 cases 3 only were successful. Seven deaths were recorded, and there were two cases in which no favourable result ensued. It seems possible that in some of these cases the serum was given in too small doses; in others it was employed too late. It may be that it is of no service in cases in which organisms divergent in character from streptococcus and staphylococcus are concerned. On the other hand, it is also possible that the improvement after its use late in disease may be due to the natural fall of temperature which often occurs. Sir Douglas Powell alludes to a case in which apparent benefit ensued from the employment of yeast given by the mouth for several weeks, but the patient refused to continue with the remedy, and finally died from the disease. In a second case, however, under the lecturer's own observation, the injection of yeast culture, "a fairly concentrated cultivation of yeast in saccharine water," prepared by Messrs. Burroughs, Wellcome, and Co., was employed, from 20 to 30 minims of yeast being injected into the subcutaneous tissue every second day, from the 1st of July to the 1st of September. Soon after the commencement of the yeast treatment right pleurisy with effusion occurred. But with this interruption the intervals between the rigors gradually prolonged, the temperature became quite normal, and in three months the patient recovered. In 4 other cases no marked results followed; they were, however, in an advanced state with splenic and other embolisms. Dr. Vaughan, of Michigan, has advocated the use of nuclein and nucleinic acid in the treatment of microbic diseases, holding that they are indirect germicides, increasing the number of white corpuscles (the polynuclear cells), on the constituents of which the germicidal property of blood serum depends. It may be that the nuclein derived from the cell walls has been material in leading to the usefulness of yeast in the cases in which its employment seemed beneficial. One case of ulcerative endocarditis is recorded where nuclein was used, and the

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effect on the temperature appeared at first striking. Eventually it rose under what appeared to be an embolic incident.

The lecturer concludes with some remarks on three kinds of exercise which are now from time to time used in cardiac disease, viz., massage, the resistance exercises of Schott and the graduated exercise of Oertel. Massage is not advisable in acute heart affections. It should be discouraged as long as there is any daily rise of temperature. It is a means of helping the convalescent stage. The resistance exercise known by the name of Schott or Nauheim treatment is specially adapted for the initial treatment of flabby, irritable hearts, cases of fatty infiltration and impaired metabolism, which are met with in people of venous plethora. In cases of chlorosis with dilated heart, after a preliminary week or two of complete rest, the Schott treatment is valuable if combined with a bracing climate and a chalybeate. In the first commencing failure of the heart in chronic valvular lesions the treatment may be employed combined with a more or less complete cessation from all other exercises. It may be also carefully tried in certain cases where the presence of atheromatous changes in the coronary arteries is indicated by a certain degree of plethora and by breathlessness attended with cardiac pain on arriving at a certain stage—walking or inclined walking exercise. It is unsuited for advanced cardiac vascular changes of the nature of sclerosis, especially with granular kidneys. In endocarditis, where there is still any trace of activity, it should not be avoided. It is best avoided in the cases of introspective people with neurotic hearts.

The strong brine aërated baths of Nauheim are unquestionably of much service in some circulatory disorders. They are, perhaps, most suitable in chronic rheumatism and gout associated with high tension, and secondary cardiac disturbance. They may be used in some cases of functional excitement of the heart's action in connection with the imperfectly compensated valvular affections. Where there is high tension, baths of higher temperatures calculated to lower tension and stimulate surface circulation are the more useful. In more neurotic cases with sounder hearts the lower temperatures may be employed.

The Oertel treatment of graduated walking exercise with a dietary restricted in fluids to 3 to 6 ounces a day has the advantage that it can be undertaken in the open air. Sir Douglas Powell draws attention to the desirability of patients taking full inspiration during open-air exercise. The constant aspiration of the elastic lung as an aid to the circulation is scarcely yet sufficiently appreciated in practical medicine.

J. N. Platt.

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Diseases of the Throat and Nose.

UNDER THE CHARGE OF A. HODGKINSON, M.B., B.Sc.

THEISEN (C. F.). "Tuberculosis of the nose, with report of a case of primary tuberculosis."—*Albany Medical Annals*, March, 1898.

THE patient, a man aged 36, a strong healthy man, contracted a severe head cold following an attack of "la grippe," and became conscious some time afterwards of left nasal obstruction accompanied by considerable secretion. The patient's family history was good, and the patient had himself enjoyed good health. There was, however, a doubtful history of syphilis. On examination the inferior turbinal and septal mucous membrane of the left nostril was inflamed. A growth somewhat larger than a small cherry, with an irregular surface, was found attached to the cartilaginous septum, attached by a broad base, not freely movable and firm to the touch.

The growth was removed by means of a cold wire snare, and its attachment destroyed by means of the galvano-cautery. Microscopically it was found to be a granulation growth containing numerous bacilli. The area of its attachment was thoroughly treated by means of applications of lactic acid (40—80 per cent solution), and iodoform insufflations.

Complete cure resulted. The author remarks upon the rarity of primary nasal tuberculosis and upon the value of microscopic examination of portions of tissue removed. He also makes some pertinent remarks upon the differential diagnosis between nasal syphilis and nasal tuberculosis :—

(1) Nasal syphilis is always accompanied by a very severe inflammatory condition of the surrounding mucous membrane; not so, as a rule, in tuberculosis.

(2) The favourite location for specific lesions is the bony septum, and in tuberculous the cartilaginous.

(3) In syphilitic bone destruction there is almost always a very offensive fœtor, rare in tuberculosis.

(4) In ulcerative nasal syphilis, as a rule, there is headache or trigeminal neuralgia; usually this is absent in tuberculosis.

W. Milligan.

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GIBB. "The differential diagnosis of ulcerative diseases of the pharynx and larynx."—*Medicine*, January, 1898.

THE chief causes of ulceration in the pharynx and larynx are syphilis, carcinoma, tuberculosis, and lupus. The history, course, and appearance of lupus are so essentially different from the congenerous forms of ulceration that it may, so far as diagnostic difficulties are concerned, almost be eliminated from the group. Carcinoma in its early stages offers many difficulties, but these disappear with the rapid aggression of the malignant process. The crux of the laryngologist is in the differentiation practically of syphilis and tubercle, whether affecting the larynx or pharynx. The author draws up an exhaustive series of comparative tables, including the four forms of loss of substance indicated, and refers to the principal diagnostic differences which in his opinion will prove auxiliaries to successful differentiation.

Syphilis.—In the pharynx the gummy tumour, presenting a reddish mass—later to appear grey in the centre, and slightly elevated from the surrounding tissues—very rapidly breaks down and becomes an ulcer, clear-cut and deep, covered with thick yellowish pus and threads of necrotic tissue; an areola surrounds it, and the edges are indurated. Gummy tumours and ulcerations show little tendency to immigrate into new anatomical regions; thus the pharyngeal affection rarely extends to the naso-pharynx, and never to the larynx. On the other hand, laryngeal ulceration never extends to the pharynx; but carcinoma ignores anatomical boundaries, and may spread in any conceivable direction. This statement is compatible with the assertion that there may be separate involvement of different portions of the respiratory tract at the same period. The most common sites of ulceration are the postero-lateral wall of the pharynx and the tonsils, and the morbid process indelibly marks the place of its visitation with a stamp of scar-tissue.

Tuberculosis.—The early symptoms of pharyngeal tuberculosis are similar to those of other ulcerative conditions, viz., soreness of throat and painful deglutition; but the victim of the ravages of tubercle is usually pale, anæmic, perhaps wasted and suffering from considerable elevation of temperature, whilst the syphilitic or cancerous patient may, apparently, up to the onset of the specific ulceration have been a healthy individual. The mucous membrane is pale, and covered by thick tenacious ropy mucus. There may be several small spots of ulceration, or two or more of them may have coalesced, forming one good-sized ulcer. The ulcer is on a level with the surrounding tissues, and does not present a punched-out or deep appearance. The edges are not clear-cut, but seem to shade gradually into the surrounding tissues. There is no induration or areola. There is very little discharge from the

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ulcer. When to these appearances are added the presence of hectic high fever, etc., the sum total of signs and symptoms should irresistibly draw the surgeon to a diagnosis of tuberculous ulceration.

In the larynx, it should be borne in mind, any form of ulceration may cause constitutional disturbance, so that the diathetic indications of tuberculosis would here be of less value. A loss of substance in the common (inter-arytenoid) situation presents a very similar appearance to the pharyngeal lesion. There is also the same troublesome accumulation of mucus, and, added to this, especially when the epiglottis is ulcerated, a severe pain in the ear.

Carcinoma.—The first symptom, in the author's opinion, is pain. It is lancinating and often intolerable, at first complained of during deglutition only, but later becoming the constant companion of the sufferer. There is stiffness at the angle of the jaw, and enlargement and tenderness of cervical glands. The presence of persistent sore throat, accompanied by difficulty in deglutition and severe pain in the ear, in a person past middle life, should put us on our guard, and we should at least suspect the presence of malignant disease. As the disease progresses the cancerous cachexia becomes apparent. The tonsil is the most frequent starting point, and the course of the disease is frequently exceedingly rapid. Gibb has observed a case from the very incipiency, and the tonsil at first presented a dark red appearance, with a greyish-white spot in the centre. It seemed as if the mucous membrane were pushed outward by some body embedded in the tissue of the tonsil. The velum, posterior wall of pharynx, and all surrounding tissues on the affected side were hyperæmic. The growth of the mass was very rapid, and within a month it exceeded the confines of the tonsil and spread over the surrounding tissue in a cauliflower-like manner. Within three months ulceration took place. This process, in cancer of the pharynx or larynx, is characteristic. It does not appear as a loss of tissue alone, but rather as a substitution of the abnormal for the normal, and ulceration of the former. The involvement of surrounding structures is rapid, and the destruction and discharge of dead tissue is accompanied by more or less free secretion and a very disagreeable odour. In the larynx the first symptoms are impairment of the voice and pain. Later, dyspnœa and ulceration, with hæmorrhage, may occur. Dysphagia is not a constant symptom.

Lupus.—This disease is very insidious in its approach, and of an exceedingly chronic nature. It consists at first principally of an infiltration of cells and thickening of the tissues; later, a slow breaking down or, rather, absorption. The ulcerative process is so slow that, in the author's opinion, there can seldom be distinguished a true clearly definite ulcer. The healing process is evidenced by a number of

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unsightly and distorted cicatrices. Discomfort is present rather than pain, and deglutition and phonation are in a measure interfered with in proportion to the amount and locality of tissue involved.

The differential diagnosis of the four forms of ulceration enumerated is assisted by the examination of microscopic fragments, and sometimes by the exhibition of drugs, such as iodide of potassium.

Eugene S. Yonge.

Diseases of the Skin.

UNDER THE CHARGE OF H. G. BROOKE, B.A., M.B.

THE ETIOLOGY OF ZOSTER.

THERE can be no doubt but that the tendency to unite together into one group all the affections of the skin, which are distinguished by the development of one striking symptom, has done much to retard our knowledge of some very different varieties of disease. In the case of herpes, where the symptom was so markedly alike in all, it has required decades to effect the differentiation of the pathological processes which may produce herpetic vesicles among their other symptoms. And it is certainly only within the last ten years that any satisfactory explanation has been offered of the peculiar features which distinguish zona, or zoster, from the rest of the group.

The present state of the question is very well presented in two recent articles, "The Etiology of Zoster," by Dr. W. Gilbert Hay, (San Francisco), in the *Journal of Cutaneous and Genito Urinary Diseases*, January, 1898, and by M. Grosjean, "Les diverses théories sur la nature et la pathogénie du zona," in the *Gazette des Hôpitaux*, Nos. 15 and 18, 1898.

Willan and Bateman were apparently the first to distinguish zona from the other herpetic eruptions, and to them is due its usual name of herpes zoster. Parrot in 1856 gave the first clear account of the disease, and recognised the intensity of the pain usually connected with it, which he considered to be a neuralgia or rheumatism of dyspeptic nature, to which the eruption seemed to be only a secondary manifestation. Following this came Baerunsprung's demonstration of inflammatory implication of the posterior nerve roots and ganglia in two cases of zona (1864-5), a discovery which was supported by autopsies made subsequently by Charcot, Cotard, Vulpian, and a number of other investigators, all of which tended to establish the ganglionic theory of

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the disease. The first autopsy, which included a complete examination of the nerves and cord as well as the roots, was made by MM. Pitres and Vaillard in 1883, and showed that a diseased nerve trunk alone might give rise to an intercostal herpes while the root of the nerve and the cord remained perfectly healthy. This led them to ascribe the origin of the attack to a peripheral neuritis.

The net result of all these autopsies was to show that the compression of nerves or nerve ganglions have a manifest influence on the nutrition of the skin, and that in certain of these cases it was right to attribute to these compressions eruptions which resembled zona. But they did not justify the conclusion that the lesion of one or more spinal ganglia is the essential cause of the eruptions of true zona. A large number of reports have been made in which certain zosteriform eruptions have supervened upon a trauma, such as a crush or amputation, which has injured the nerve trunks, and where the eruption constitutes the cutaneous expression of a peripheral neuritis. It is, however, probable, as some authors have pointed out, that this condition of the peripheral nerves is really due to an affection of the higher portions of the cord or of the brain, as so many of the previously supposed peripheral alterations are now held to be. Charcot noticed that zona not unfrequently follows certain lesions of the cord, such as locomotor ataxy and infantile paralysis (Payne), and of the brain, such as hemiplegia (Duncan), which bears out this view. Graham also reported a case of zoster of one side of the face which attacked the other side on the fourth day, and on the fifth day the patient died. The autopsy showed softening of some parts of the brain, with inflammation of the Gasserian ganglion and around a portion of the fifth nerve.

The discrepancy which exists between the eruption and the cutaneous distribution of the nerves has been noticed by many writers. At times the vesicles are limited accurately to the distribution of certain nerves or zones, at others they spread over areas supplied by contiguous nerves. Brissaud has attempted to explain this by the arrangement of the fibres of the centripetal nerves. Thus if the posterior ganglion of the posterior root alone is affected, the eruption will be strictly confined to the area supplied by the nerves connected with that root; but if the exciting lesion were in the cord, then, even if it were quite small in extent, it would be sure to involve the ascending and descending collaterals of the primary centripetal neuron as it enters the cord through the posterior root, and by their connections with the nerves above and below there would necessarily be a certain transmission of the irritation to these nerves, with a corresponding outbreak of herpes in the areas which the involved nerves supplied. That certain of the cases of zona are of spinal origin seems to be borne out by the instances in which large and

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accurately defined areas of anæsthesia have existed synchronously with smaller areas of herpetic eruption, the anæsthesia being only explicable as a symptom of a spinal lesion, though the herpes was limited enough to be referred to one nerve. And Brissaud has insisted on the frequent diffuseness and vagueness of the pains which accompany zona and the absence of painful points so characteristic of peripheral neuritis, which could only be explained on the supposition of their spinal origin. Sometimes the pain is symmetrical whilst the zona is unilateral, or it may be on the opposite side to the zona and at a different level (Dougradi). In further support of the central theory of origin of zoster may be cited three cases by Brissaud in which ophthalmic zona was accompanied by peduncular hemiplegia (crossed), and which was not therefore merely an expression of a lesion of the Gasserian ganglion. There is also the co-existence of muscular atrophy with zona of facial paralysis and paralysis of the limbs of an extent which cannot be explained by peripheral neuritis alone. Wherever the mischief commences, however, it is apparently by an extending neuritis that the irritation spreads so as to produce the eruption on the skin. The possibility of a simple transmission of the irritation through the nerve fibres without any alteration of their tissue is of course not excluded, but the former alternative has been proved to have existed in a number of cases. Indeed, so far, peripheral neuritis is the only lesion of the nerves which has been observed.

The Origin and Nature of Zona.—Even so far back as the last century Lorry and Hoffmann compared zona to a chronic erysipelas, and declared that it was contagious. Later Borsieri looked upon it as an eruptive fever, and Trousseau noticed that it was sometimes transmitted. But Landouzy (1883) was the first to definitely formulate the infective theory in an article entitled "Zoster Fever and the Zosteriform Eruptions," in which he arrived at these conclusions :—(1) Zoster fever must be distinguished from the zosteriform eruptions ; there is between them all the difference which distinguishes a malady from a symptom. (2) Zoster, which is an acute disease, almost cyclic, infectious, conferring immunity, is a general infection specially confined to the nervous system (it is an infectious neuropathy), the dystrophy of the skin being a secondary development. (3) There is a general disease zoster, as there is scarlatina ; there is a zoster fever as there is a scarlet fever, and zosteriform eruptions as there are scarlatinaform erythemata, and as there is a parotidian fever and parotitides.

Grindon (*Journal of Cutaneous and Gen. Urinary Diseases*, 1895), helped to elucidate these distinctions by classifying the zosteriform eruptions, which he calls "zosteroids." Into this group he puts all the zoster-like eruptions arising from the following causes :—(1) Chronic

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peripheral irritation. (2) Traumatism: (*a*) central, (*b*) in continuity, (*c*) peripheral, (*d*) reflex. (3) Pressure on a nerve trunk (osteophytes), infiltration of surrounding tissues, pleuritic adhesions). (4) Infiltration of a nerve or ganglion by some simple neoplasm or a simple filtration of a simple (in this regard) non-specific inflammation. (5) The presence in the blood of some irritating substance, such as lactic or uric acid ("arthritism"). To this latter class might be added the cases of herpes observed on the course of certain nerves (sciatic, ulnar, fifth) in poisoning by carbonic oxide, and occasionally during the administration of arsenic.

The arguments in favour of the infectious nature of zoster, as apart from these zosteroids, may be briefly summed up under a few headings: —(1) One attack almost invariably confers immunity. The immunity is by no means absolute, but of 61 reported cases of recurrence, Grindon believes that only 6 were true zoster. Other infective diseases recur, and so may zona; and if it is merely the occasional efflorescence of intercostal or trigeminal neuralgia, then it certainly does recur. (2) The fever, and the similarity of the course of the disease with that of other infectious exanthemata. (3) A number of cases have been reported in which the disease was transmitted from one to another; from a mother to a son who attended her during an attack; the disease occurred in three students who successively inhabited the same room; attacks appearing in the members of the same family in rapid succession (Jamieson). (4) It occurs in epidemics—in Paris, especially in August and September; in Vienna in the spring and autumn; and in San Francisco (Cantrell) in October and November. (5) Zoster is endemic in certain regions; in California it is more common in relation to the population in the valleys than in the mountains. (6) The occurrence of swellings of the lymphatic glands (Barthélemy) either in the neighbourhood of the eruption or on the opposite side, or as a general adenopathy, pointing to a poison influencing the whole body. (7) The development of paralysis in conjunction with the eruption and of pain or other subjective symptoms in regions remote from the eruption.

All these facts go to prove that in zona we have a general systemic poisoning; and, although the eruption is usually limited to the course of one or two cutaneous nerves, there are cases which occur in the branches of several different nerves at once, and which cannot be explained by the theory of peripheral neuritis alone, or by Pfeifer's theory of capillary embolism. It is quite a probable suggestion that the primary irritation may arise in the sympathetic nerves; for Gaule, in his experiments on the sympathetic ganglia, shows that irritation of the ganglion cells produces a change in them which exerts its action by

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spreading through the branches of communication with the posterior roots of the spinal nerves, in a centripetal direction, to the spinal ganglion, and thence to the cord. The changes produced, which are trophic in nature, do not only occur in the sphere of the nerve whose ganglion is operated upon, but over the whole body, and on the opposite side, so that the disturbance in the trophic functions must spread through the central organ of the nervous system to the origin of the other nerves. Were we to assume that the infective agent in zoster attacked the sympathetic ganglia, we should have an explanation of the following facts:—(1) The failure heretofore to find anatomical lesions sufficient to account for the symptoms; (2) the simultaneous occurrence of the eruption on the skin, with symptoms of internal disease; and (3) the patchy character of the eruption, involving areas of different origin.

Hay examined microscopically swollen glands antiseptically excised from cases of zona, and found undoubted micro-organisms, but made no culture experiments. Unna, considering the circumstance that the vesicle, with completely degenerated epithelium, rises sharply from almost normal epidermis, thinks it probable that the presumptive parasites lie in the epidermis itself, and chiefly exercise their activity locally. Many cases of zoster have been cited as consequent upon injury to peripheral nerves, in which case the anatomical lesion is a centripetal neuritis. This argues the entrance of an infectious agent, because if the wound remains aseptic, as the experiments of Rosenbach and Kast have shown, such a propagation of the inflammation above the point of the lesion never occurs. Here, however, we are in the region of hypothesis; and, although much has been done to render certain the existence of an infectious agent in the production of zoster, the exact nature of the agent still remains unknown.

ANDERSON (WILLIAM, F.R.C.S.). "The surgical treatment of lupus."—*St. Thomas's Hospital Reports*, 1897.

MR. ANDERSON very rightly deprecates the practice of merely erasing patches of lupus as is so often practised, on account of the active remnants which are left behind in the meshes of connective tissue which the spoon cannot reach. But although he certainly under-estimates the value of selective caustics, such as pyrogallol and salicylic acid, when used alone (for they are often quite successful), he finds them of great service when they are used (as they always should be) to complete the destruction of the outlying particles of lupoma which the spoon has not touched. His preference, however, is for excision, whenever it is practi-

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cable. All small patches up to the size of a crown piece he invariably excises, and finds it the most thorough, speedy, permanent, and sightly of all the plans of treatment. The line of excision should run from a third to half an inch outside the growth, and should go down to the subcutaneous fat. After the bleeding has been stopped, the wound may be sutured up at once; or if it is to big for suturing, or its position will not allow of this being done, it may be washed with 1·20 carbolic lotion, and dressed with salicylic ointment (20—30 grains to the ounce), until it has filled up, when it may, if necessary, be grafted. On the face care must be taken not to go so deep as to injure the nerves, and where complete excision is impossible, the edge alone may be excised, and the centre erased thoroughly. The excision of the edge often causes the disappearance of the central nodules, and the results thus obtained have proved most satisfactory.

Pathology and Bacteriology.

UNDER THE CHARGE OF A. SHERIDAN DELÉPINE, M.B., B.Sc.

OPIE. "On the hæmocytozoa of birds."—*Journal of Experimental Medicine*, Vol. III., 1898.

MACCALLUM. "Notes on the pathological changes in the organs of birds infected with hæmocytozoa."—*Ibid.*

MACCALLUM. "On the hæmocytozoan infection of birds."—*Ibid.*

IN the first of these papers the writer records the results of some observations made by him in the clinical laboratory of the Johns Hopkins University. Attention is drawn to the fact that parasites have been found in the blood of birds resembling the parasites of malaria in the human subject. Parasites have been found in the blood of animals by different observers. Ten years before Laveran discovered the malarial parasite, Ray Lankester had observed worm-like bodies in the plasma of frog's blood, and Butschli, in 1876, decribed bodies inside the red blood corpuscles of frogs. Gaule (1880) described similar bodies in the corpuscle itself, and considered them as resulting from degenerative changes; but Lankester, in 1882, established their parasitic nature. Danilewsky (1885) first described intra-corpuscular parasites in the blood of lizards, tortoises, and birds. In birds, he described various forms of parasite: (1) *Pseudo-vacuoles*, clear areas of variable size and shape within the red blood corpuscles, enclosing granules of pigment; (2)

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pseudo-vermiculi, elongated bodies freed in the plasma, and having active wriggling movements. The first of these varieties subsequently escape from the cells and undergo the process of flagellation. At times the flagella become detached, and maintain their active motion for a time, and these were termed *pseudo-spirilla*. Grassi and Feletti also describe organisms in sparrows of two distinct types—a crescentic form corresponding to the pseudo-vacuoles, and a smaller organism closely related to the amœboid forms of the true malarial parasite, and which they call hæmamœba. Celli and Sanfelice also describe organisms in birds corresponding to the human malarial parasites. Danilewsky has furthermore attempted to demonstrate the existence in infected birds of symptoms analogous to those of the malarial fevers. Inoculation of the blood of an infected bird into that of a bird of the same species has been successfully performed by Celli and Sanfelice, Laveran, and by Labbé; but other observers have failed, and Mattei failed to inoculate sixteen pigeons with the blood of malarial patients, and also failed to inoculate men with the blood of infected pigeons.

The observations of Opie were made during the months of June, July, August, and September, 1896. The number of birds examined was 125, the majority of these being English sparrows, the remainder being chiefly red-wing blackbirds (Agelaius phœniceus). The birds were obtained from notoriously malarious districts. Fifteen of them showed intra-corpuscular parasites in varying abundance, the types of which were two corresponding to the two above-mentioned varieties of Grassi and Feletti. In most of the infected birds one type alone was found, but in three birds both varieties were present at the same time. In the intra-corpuscular parasites a process of segmentation analogous to that observed in the human parasite was observed, while in the second variety no such segmentation was noticed. In the latter, however, the process of flagellation was well seen, the flagella making their appearance with remarkable rapidity, two to four appearing at the periphery, and, after persisting for some time, finally disappearing. These last observations were made in fresh specimens of blood; for observing the other forms of parasite, the blood was fixed and stained with eosin and methylene blue by Romanowsky's method. The observations of the writer generally confirm those of Danilewsky and of Grassi and Feletti, mentioned *supra*.

In the second paper, MacCallum records the results of his examination of the organs of the infected birds examined by Opie. Several authors (Danilewsky, Kruse, and Labbé) have given brief descriptions of deposits of pigment, etc., in the hæmopoietic organs of infected birds. MacCallum finds in the liver deposits of pigment in larger or smaller masses, the larger masses being contained in large cells, which resemble

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closely the macrophages described as occurring in the organs of human malarial subjects. The pigment in these cells is of two chief forms: (1) Pigment formed by the parasite, blackish-brown granules; (2) straw-coloured pigment, probably derived from remains of the hæmoglobin set free when an infected red blood corpuscle breaks down. The former gives no reaction with the ordinary tests for iron; the latter gives the iron reaction, but after deposition in the tissues for a certain time this also ceases to react. Besides these various forms of pigment, the macrophages frequently contain infected red blood corpsules. No cells corresponding to Kupffer's cells in man were found. The liver cells themselves have not been observed to be phagocytic, but considerable pigmentation was noticeable in one or two cases, and the iron reaction was well marked.

Necrosis was observed in some cases, affecting the liver in small and discrete foci, in which the liver cells are destroyed and replaced by débris containing nuclei and occasional macrophages, enclosing pigment. In addition, cells containing small oval bodies, sometimes arranged in a radiating manner, resembling the segmenting bodies of a malarial parasite, are found. These latter are not limited to the areas of necrosis, but are found in the capillaries of the liver elsewhere, and are also found in the spleen. In the spleen deposits of pigment, similar to those found in the liver, are seen, and also degenerative changes analogous to the process of necrosis. In the bone marrow marked pigmentation was not observed by MacCallum, and no marked pigmentation was seen in the viscera, no increase of pigmentation being noticed in the lung.

As regards the blood itself, the morphology of the leucocytes shows a general resemblance to that observed in human beings, but these corpuscles play little part in the changes in the tissues.

In the third paper MacCallum records the results of some observations made by himself on the same lines as those of Opie and Labbé. As a result of these observations, the author deduces the remarkable conclusion that the flagellated forms of malarial parasite play an important part in a sexual process of reproduction. One form of malarial parasite, of granular and spherical form, after extrusion from the red blood corpuscle, remains quiet, and is then fertilised by a flagellum which has broken away from one of the flagellated forms. The result of this fertilisation is a mobile stage which seems more resistant, and it is thought possible that this form may make its way through the intestinal canal to the external world. The author gives the details of some experiments bearing out these views, and alludes to the diverse views held as to the nature of the flagellated malarial organism in the human subject, and from analogy thinks it possible that its significance is similar to that given by him for the organism of birds.

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In a short addendum to the paper, the author claims to have observed the sexual process of reproduction of the malarial parasite in the blood of a female patient.

A. E. Brindley.

HOWARD, jun. (W. T.). "Influence of cow's milk on the spread of diphtheria."—*American Journal of the Medical Sciences*, December, 1897.

DR. HOWARD first enumerates the various diseases about whose relation to the milk supply we have more or less conclusive evidence. These are tuberculosis, enteric fever, cholera, diphtheria, scarlet fever, erysipelas, and measles, also anthrax, pleuro-pneumonia, and hydrophobia in cattle.

Taylor, in 1870, was the first to trace the connection of an outbreak of scarlet fever to the milk supply; since then Power, Klein, and many others have studied epidemics of milk-borne diseases.

Only one outbreak of scarlet fever outside England has been traced to the milk supply (by Johansen in Christiania, 1884), and no milk-borne epidemics of diphtheria have been reported outside England (Escherich, 1894). Flugge (1894) concludes that diphtheria is never transmitted by food, such as milk and meat.

Power in 1879 investigated a diphtheria epidemic in the north of London, in which 264 cases occurred in 116 households. 15·5 per cent of the houses supplied by one dairy were attacked, while of other houses in the same district only 1·3 per cent were attacked, which is a proportion of 12 to 1.

In 1886 Power studied another milk-borne epidemic in Yorktown, Camberley, where 747 people were attacked with diphtheria and other similar throat diseases.

Of 176 households investigated, 94 took the suspected milk, and 48 were attacked, with 80 cases and 15 deaths.

Of the 82 houses with other milk supplies 9 only were attacked, with 6 true diphtheria cases, 10 minor throat ailments, and only 1 death.

In neither of these outbreaks could trace of human infection of milk be found. Power, in 1887, found that in the Ealing diphtheria epidemic the consumers of milk from one dairy suffered more severely than the rest in the proportion of 20 to 1.

Clark at Melrose and Malden, Mason and Klein at Barking, Phillpots at Croydon, found that in outbreaks of diphtheria the incidence in

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consumers of certain milk was from 6 to 8 times as great as on the rest of the community.

In American literature there are only two cases of diphtheria epidemics attributed to milk (Goodwin and Stillman), but both were small outbreaks confined to two or three families.

In 1894, the writer, Dr. W. T. Howard, on the invitation of the Health Officer, visited Ashtabula, Ohio, to study a serious outbreak of diphtheria.

Ashtabula, a town of 12,000 inhabitants, situated on Lake Erie, is divided into two parts, the port and the town proper. The port has a floating population of 3,000, of mixed nationalities, the houses are small and insanitary, the inhabitants, poor and uneducated, are careless of all sanitary rules, so that this part of the town is rarely free from infectious disease.

The town proper is two miles inland, on a higher level, with a much better class of inhabitants. Both parts have water supply from the lake and wells.

From January 1st to December 1st, 1894, 87 cases of diphtheria were reported from the port and 18 from the town.

On December 5th there was a sudden outbreak in the town, where there had been no cases for some time, and from the 5th to the 13th there were 67 cases in 49 houses, while to the end of the month there were 100 cases in all, with 24 deaths.

It is probable that all cases were true diphtheria, as the diphtheria bacilli were found in every case examined. The local Health Officer early in the outbreak suspected the influence of the milk supply, and found out that all the infected houses received their milk from the same source, and milk drinkers were attacked in greater proportion than others.

There were two dairy farms at opposite ends of the town, which are called X and Y, the latter supplying two-thirds of the town. None of the consumers of the X milk were attacked, with two exceptions, and both these had taken milk from the Y dairy on one occasion.

The Y milk was distributed in two waggons, one, a white one, in the town proper, the other, a red one, in the port, and it was found that of 44 infected houses, 32 were served by the white waggon and 12 by the red.

On inquiry at the Y dairy, the owner and family and workmen had been quite well, with the exception of one son, who amongst other duties drove the white waggon. He was taken ill on December 1st with "sore throat," general malaise, and body pains, and was off work for two days, but was

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not ill enough to go to bed or to call in a medical man. The Health Officer examined his throat on December 9th, and found congestion and one tonsil enlarged, but no false membrane, and on a bacteriological examination no diphtheria bacilli were found. The dairy was found well ordered, clean, cows in good condition, no sores or swellings, pans clean, and no diphtheria bacilli could be found by cultures from milk in cans or from the cows' noses and throats. Other possible sources of infection were discussed, but excluded, and though the evidence is not conclusive, this outbreak appeared to be closely connected to the milk supply.

Observers do not agree as to the effect of inoculating cows with the diphtheria bacillus. Klein found that visceral lesions ensued, that ulcers developed on the udders, and in one case diphtheria bacilli were found in the milk and in the vesicles on the udder.

In various milk epidemics invested by Klein, he has found ulcers on udders of cows, but does not state that he found the diphtheria bacillus. Streptococci are also found, and this may give rise to a pseudo diphtheria. Loeffler has shown that the micro-organism of bovine diphtheria is totally different from that of human diphtheria.

Dr. W. T. Howard concludes by stating that our present knowledge seems to point to the fact that milk-borne diphtheria outbreaks arise from a human focus in the collection or distribution of the milk.

J. R. Carver.

Reviews.

"Manual of Mental Diseases." By A. Campbell Clark, M.D., F.F.P.S.G. London: Baillière, Tindall, and Cox.

In our opinion a text book on mental disease need contain no elaborate anatomical description of the nervous system for two reasons—Firstly, because an adequate treatment of nerve anatomy can only be dealt with in a large treatise which can always be referred to in case of need; and secondly, because at present so little is known of the exact parts of the nervous system which are affected in mental diseases, that no useful purpose can be fulfilled by a complicated account of the normal nerve cells and nerve fibres. But it does seem to be necessary for a manual of mental disease to contain some reference to mental physiology, as most students have no previous knowledge of the subject, nor have they, as a rule, a reference book at hand; and, moreover, some knowledge of

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normal mental processes is necessary before the abnormal mental processes met with in mental dissolution can be thoroughly understood.

Dr. Clark evidently agrees with these opinions, for in his book there is no account of the anatomy of the nervous system; but there is a clear and carefully written summary of mental physiology, which is beautifully worked out by a study of the evolution of mind in a child.

There is another omission in the present volume with which we sympathise very much, and that is the pathological anatomy of mental disease. Certainly we do know something about the general pathological changes found in brain membranes, in cortical cells, in neuroglia, and in the blood vessels in more or less chronic mental disease; but apart from the changes found in general paralysis of the insane, we know practically nothing of any special changes which would enable us, either by a naked eye or a microscopic examination, to say whether a person had been suffering from mania, melancholia, or dementia, or whether hallucinations had been present or absent. Until we have more definite information, it would be a waste of valuable space in a student's manual to attempt to describe any special pathology of mental diseases.

Dr. Clark's book is, indeed, principally devoted to the symptomatology of mental disease. Although prognosis is alluded to from time to time, we think it would have been better if this most important part of the subject had been more largely dwelt on. The public do not care so much about an actual diagnosis, but they do most anxiously care about the chances of ultimate recovery and the length of time which may elapse before such recovery will occur. So important is this, that every manual of mental disease should contain a special paragraph after each form of insanity, stating in as full and definite terms as possible the prognosis of that particular form.

In the accounts given of melancholic stupor and of anergic stupor (primary dementia), there seems to be some confusion, and the two definite diseases are not sufficiently sharply marked off one from another. The author also describes melancholic stupor as being more common in females, whereas our experience has led us to think that it is equally, if not more, common in males. Neither are the characteristic facial expressions of the two forms of stupor accurately described, the troubled face of the melancholic stupor, generally due to the presence of an all-pervading painful delusion, as compared with the expressionless, fatuous face of the case of primary dementia.

As a rule, the book is well written, but occasionally there is some looseness of language, which in some places almost descends to "slang." This may be very expressive, but is surely somewhat out of place in a scientific treatise.

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But when we have made these complaints we have said all we can against Dr. Clark's book, for the rest of it is excellent. Especially good are the chapters on the insanities of pregnancy and the puerperium; and we were delighted to find such a very excellent account of the different forms of mental disease connected with various bodily ailments, such as syphilis, gout, influenza, phthisis, asthma, diabetes, etc. This is a subject of the utmost importance to the general practitioner, and it is one that is sometimes neglected in works on insanity. Dr. Clark does not believe with Clouston that there is any one special form of insanity peculiar to phthisis, nor does he agree with Mickle that the various forms of valvular heart mischief are associated with different and peculiar forms of mental disease; and in these opinions we entirely agree with him.

There is an admirable account of backward and feeble-minded children, and another of idiocy and imbecility. These subjects are again either omitted or treated very shortly in many manuals of mental disease, though for what reason we are at a loss to say, for surely they include the slightest and the most marked forms of mental disorder.

The last chapters are devoted to the law relating to insanity as administered in England, Scotland, and Ireland, including the Idiots' Act.

The work is illustrated with some excellent photographs of various types of insanity, and a great feature of the book is a summary of clinical cases (taken from actual records) placed at the end of each chapter, and serving as examples of the varieties of disease described.

Finally, we can heartily recommend this book as a thoroughly practical manual, and one which has been written with great judgment and clearness.

PUBLICATIONS RECEIVED.

From Baillière, Tindall, and Co. London :—

"Respiratory Exercises in the Treatment of Disease." (7s. 6d.) By HARRY CAMPBELL, M.D., B.S., Lond.

From the *Times of India* Press :—

"Report on Bubonic Plague." By Khan Bahadur N. H. CHOKSY.

From J. and A. Churchill, London :—

"A Manual of General Pathology for Students and Practitioners." (21s.) By WALTER SIDNEY LAZARUS-BARLOW, B.A., B.C., M.D., M.R.C.P.

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From Cassell and Co., London :—

"The South African Climate." (5s.) By WILLIAM C. SCHOLTZ, M.D. (Edin.).

"Ringworm in the Light of Recent Research; Pathology; Treatment; Prophylaxis." (7s. 6d.) By MALCOLM MORRIS.

From the Johns Hopkins Press, Baltimore :—

"The Johns Hopkins Hospital Reports," Vol. VII., Nos. 1 and 2. "Report on Gynæcology."

From H. K. Lewis, London :—

"Middlesex Hospital Reports for 1896." (2s. 6d.).

From John Wright and Co., Bristol :—

"Surgical Technics in Hospital Practice. (3s.) By K. W. MONSARRAT, M.B., F.R.C.S.E.

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THE MEDICAL CHRONICLE:

A MONTHLY RECORD OF THE

Progress of Medical Science.

THE DIAGNOSIS OF PATHOLOGICAL CONDITIONS OF THE ENDOMETRIUM.*

By ARNOLD W. W. LEA, M.D., B.S. (Lond.), F.R.C.S. (Eng.),

Assistant Lecturer on Diseases of Women, Owens College; Assistant Physician to the Clinical Hospital for Women and Children, Manchester; University Scholar in Obstetric Medicine, London University.

THE pathological changes in the uterine glands are of great interest and of much practical importance. This paper is based upon the examination of a large number of sections of the uterine mucous membrane in disease, and also of fragments removed by the curette. My object is mainly to point out the value of the microscope in the diagnosis and treatment of these conditions, and, in addition, to point out certain limitations to its usefulness.

It is essential to acquire an accurate knowledge of the structure of the endometrium and its varying appearances in health before we proceed to discuss the pathological changes. We may then briefly recall the normal structure of the endometrium, taking as a type this membrane during active sexual life. It is lined by a layer of columnar ciliated epithelial cells, which dip down into the mucosa, forming numerous simple glands. These pass slightly obliquely downwards to terminate in the superficial layer of the muscular coat. They often show slight convolution in their course, and their extremities are frequently bifurcated. The epithelium lining the glands remains columnar, but the cilia are lost. The cells are in health arranged in a single layer, although frequently, from the obliquity of the section, they appear to be several

* An abstract of this paper was read, and microscopic sections with lantern slides shown, at the meeting of the Manchester Pathological Society, April 13th, 1898.

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layers in thickness. The existence of a basement membrane has been much discussed, and various views have been held. It is certainly possible in favourable cases to make out a layer of flattened nucleated cells, probably derived from the stroma, upon which the epithelial cells rest. The nuclei are oval or elliptical, very granular, and may contain two or three nucleoli.

The stroma is mainly composed of oval or spindle-shaped cells, with granular nuclei, staining deeply. Between the cells, wavy strands of fibrous tissue are seen, and in the deeper layers bundles of muscular tissue. Small round or lymphoid cells are scattered through the stroma, and become greatly increased in number in inflammatory conditions.

The blood vessels are almost entirely capillaries. They are very numerous and of large size, becoming especially well seen in sections of the mucous membrane during menstruation. They may then be observed forming a well-marked layer immediately beneath the surface epithelium. In the deeper part of the mucosa a few small arteries and veins are present.

The surface of the mucosa is quite smooth in health. The thickness varies considerably in different parts of the cavity, and is much increased a few days before each menstrual flow.

In old age, commencing at the menopause, the endometrium undergoes atrophic changes. The epithelium becomes shorter, almost cubical. The glands are smaller and much diminished in number. Their epithelium is cubical. It is not uncommon to find cystic dilatation in the remains of the glands. The connective tissue stroma becomes organised into fibroid connective tissue. The capillaries become scanty in number, the epithelium proliferates, causing occlusion of their lumen. The small vessels also show thickening of their connective tissue sheath. As a result of these changes, the mucous membrane becomes thin and dense, being firmly attached to the muscular coat. The glands, even in old age, rarely disappear entirely; and it is not uncommon for activity to manifest itself after the menopause, leading to catarrhal processes, or to malignant forms of growth.

Changes during Pregnancy.—The endometrium becomes enormously thickened, forming the decidua, which consists of enlarged and hypertrophied glandular spaces, with a vascular connective tissue stroma, containing large flattened cells, the so-called "decidual cells." The basal part of the mucous membrane in contact with the muscular coat does not take part in the formation of the placenta, nor is it entirely shed when the contents of the uterus are expelled, as in abortion. In this layer we find the glandular spaces much enlarged and of irregular outline, the cells are flattened, and usually show catarrhal changes.

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It is often necessary to curette the uterus for pathological conditions connected with gestation, and it may also be important to ascertain with certainty the previous existence of pregnancy. This can usually be settled by microscopic examination of the curetted fragments. (1) *Chorionic villi* may be recognised with their characteristic lining of deeply-stained epithelial cells. The villus usually appears to be made up of connective tissue containing a few nuclei. It is often surrounded by a blood space. In specimens which have been retained some time in utero, the epithelium is seen to be degenerating and disappearing, the villus is seen to be much smaller, and is infiltrated with connective tissue nuclei. Still they may be identified with certainty some months after the death of the embryo, as in cases of missed abortion or molar pregnancy. (2) *Decidual cells* are often discovered. These are large

FIG. 1.—Chorionic Villi with Decidual Cells.

polyhedral, or oval cells, with deeply-stained nuclei, usually met with in groups in various parts of the sections. They are not in themselves characteristic of intra-uterine gestation. Similar cells are seen in the casts of membranous dysmenorrhœa, and also in the decidual cast from cases of extra-uterine pregnancy. I have also often found similar cells in cases of chronic endometritis, when the previous existence of pregnancy could be excluded. (3) Fragments of *decidual glandular tissue* may be seen in some sections. The gland spaces are much enlarged and tortuous, as described above, and to an experienced observer they are very typical of the previous existence of intra-uterine gestation.

Chronic Endometritis.—This disease occurs in several distinct forms, and, from the observations of Ruge, Wyder, and others, has been divided into the following varieties:—(1) *Glandular endometritis*, in which there

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is great hypertrophy of the glands. In some the gland spaces appear to be much enlarged and tortuous; in others an increase in the number of the glands is the most marked feature. (2) *Interstitial endometritis*, in which the most extensive changes are met with in the connective tissue stroma, which is infiltrated with round cells. (3) A form in which these two varieties are combined. This is often associated with cystic dilatation of glandular spaces and the formation of marked irregularities on the surface of the uterine mucosa. This has been called *villous* or *polypoid endometritis*. In many of the latter cases, however, there is little evidence of inflammatory action. The changes seem to be mainly the result of increased growth and vascularity, and they are more accurately described as cases of benign adenoma of the uterus.

Chronic glandular endometritis occurs as the result of different forms of irritation, such as the entrance of various micro-organisms, and disturbances in the circulation and nutrition of the uterus. It is still doubtful if bacterial invasion is essential to its production. Recent

FIG. 2.—Chronic Glandular Endometritis, showing surface of mucous membrane, increase in size and number of glands, proliferation of connective tissue stroma.

bacteriological investigations tend to show that the mucous membrane is always sterile in these cases, and, microscopically, organisms have very rarely been discovered. There is no doubt, however, that infection by organisms is the usual cause of the process in the first instance. The following description is based on the examination of uteri removed during life, and also on curetted fragments.

The endometrium is usually quite smooth. It is much increased in thickness and very soft. The surface occasionally shows slight hæmorrhages. The epithelium is intact as a single layer of columnar cells. It is difficult to recognise the cilia in hardened specimens. The glands are

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greatly increased in number, and very tortuous. The epithelial lining is seen in many places to be actively proliferating, so that it may almost fill the lumen of the gland. The cells may also be seen apparently

FIG. 3.—Chronic Glandular Endometritis—deep layer of mucosa—showing epithelial proliferation in glands.

growing into the stroma as solid epithelial outgrowths, which eventually develop into gland spaces. These changes are usually most marked in the deeper layers of the mucous membrane. This epithelial proliferation

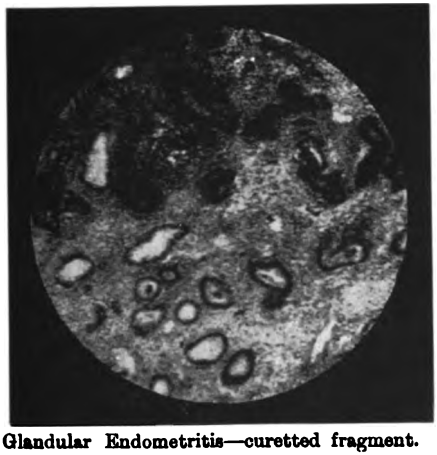

FIG. 4.—Chronic Glandular Endometritis—curetted fragment. The dark area is hæmorrhage; numerous large insterstitial cells; glandular epithelium in several layers.

and budding is extremely important to recognise, inasmuch as it has been held by some to indicate the formation of a new growth with malignant tendencies.

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The stroma is often very dense; the cells are large, with round or spindle-shaped nuclei staining deeply. There is also extensive infiltration by round lymphoid cells, often arranged in groups, especially in the deeper parts of the mucosa and the superficial layer of the muscular coat.

The capillaries and arteries often show proliferation of their epithelial lining and infiltration of their scanty connective tissue sheath. It is also not uncommon to find, even in very chronic cases, numerous capillary hæmorrhages scattered through the stroma. In other cases there is little extravasation of blood, and many small vessels appear to be occluded.

In the deeper part of the mucosa the stroma is seen to be developing into fibrous tissue, which becomes very noticeable if the inflammatory process has existed for a long time.

Chronic Catarrhal Glandular Endometritis.—In these cases the mucosa is slightly increased in thickness. The surface epithelium is cubical and is easily detached. The glands are not markedly increased in number. They are, however, much dilated and very tortuous. The characteristic changes are found in the epithelium of the glands.

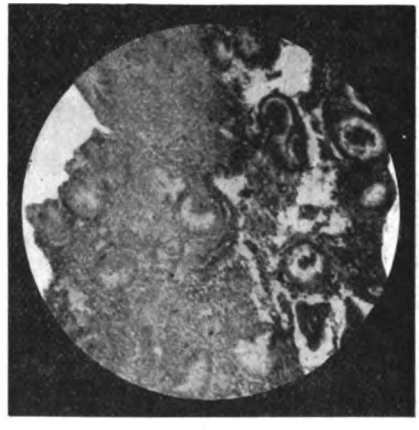

FIG. 5.—Chronic Catarrhal Endometritis—curetting (case of dysmenorrhœa); proliferation with degeneration of epithelial cells.

The cells are often shed into the lumen, and there is also evidence of active proliferation. The cells are large and irregular in outline. The nuclei stain deeply. The cell substance is often faintly granular, and individual cells are not clearly defined.

The stroma does not usually show round-celled infiltration. The cells are often much enlarged, oval, or polyhedral in shape, and may be indistinguishable from the decidual cells present in cases of abortion,

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and by many described as characteristic of gestation. I have found groups of these cells in several cases in which the possibility of pregnancy could be absolutely excluded.

In some of the sections, associated with the changes in the epithelial cells, capillary hæmorrhages are observed in the stroma, which is often loosely arranged ; the lumina of the glands may also contain blood.

This description is based upon the examination of curetted fragments from cases of dysmenorrhœa, and irregular and profuse menstruation in nulliparas, with absence of any clear history of bacterial invasion. In one case of recurrent abortion similar changes were found in the endometrium.

Chronic Interstitial Endometritis.—The mucous membrane is often thinner than in the healthy state. Its surface is usually smooth, although occasionally small projections may be seen. On section the epithelium is cubical, and in advanced cases may be flattened. The

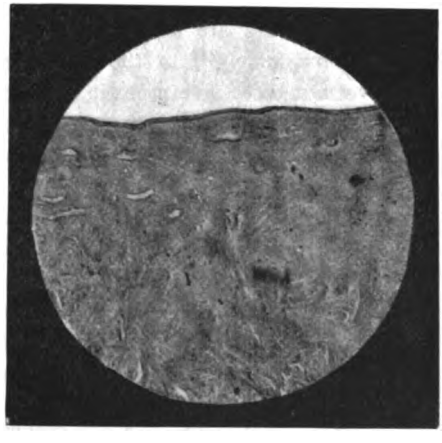

FIG. 6.—Chronic Interstitial Endometritis (advanced). The glands have almost disappeared ; epithelium of surface is cubical (10 years duration—uterus extirpated).

glands are few in number, and are usually small, but sometimes, from obstruction to their ducts, cystic dilatations may be recognised. The epithelium may proliferate, and fill the lumen of the gland. The connective tissue stroma has become mainly transformed into fibrous tissue. Round-celled infiltration is often seen, the cells being arranged in groups between the fibrous bundles of the stroma. The capillaries are often dilated, but are few in number, and the walls of the small arteries in the basal layer show well-marked endarteritis. If the whole of the mucous membrane be examined, as after removal of the uterus, parts of the

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endometrium will be found almost devoid of glands, or these may be represented by a few epithelial cell masses.

This condition of the endometrium is seen when chronic endometritis has existed for several years, and is probably the final stage into which cases of chronic glandular endometritis develop if the inflammatory process is not checked.

Interstitial inflammation is also met with in another class of cases. It is well known that in membranous endometritis (membranous dysmenorrhœa) the changes are mainly those of acute interstitial endometritis, connective tissue cells forming the greater part of the bulk of the uterine cast. There are also cases in which the curetted fragments are mainly composed of interstitial cells, with little glandular tissues. This was first pointed out by De Sinèty. In these instances the cells are very small, almost embryonic in appearance, and specimens removed by the curette show extensive hæmorrhages amongst the cells, and also surrounding the whole fragment under the microscope. The glandular tissue in these cases does not appear to have undergone much change. The curetted fragments are usually small. The masses of embryonic tissue project irregularly into the cavity of the uterus. Hæmorrhage is often a very marked symptom in these cases, and after removal there is a great tendency for the condition to recur. In one patient it was found necessary to curette the uterus on four occasions before a permanent cure was effected.

Benign Adenoma Uteri.—The endometrium presents numerous irregularities and polypoid projections from its surface. By many writers this condition is spoken of as "villous, polypoid, or fungous endometritis;" or, again, since hæmorrhage is one of the marked symptoms, "Hæmorrhagic endometritis." From the point of view of pathology these cases are more correctly described as diffuse adenoma of the uterine mucosa. The growths are often numerous. They vary in size, the largest not usually exceeding that of a pea. They are sessile, but may at times become pedunculated. Their surface is covered by columnar ciliated uterine epithelium, and beneath this their structure is composed of connective tissue stroma with round and oval nuclei in great abundance. The numerous glandular spaces are scattered through this. The glands present great diversity of arrangement. They may be very tortuous and dilated to form small cysts; sometimes they are very closely arranged together, in other cases they are less numerous. The epithelium is healthy and in a single layer. Frequently, however, solid masses of epithelium grow out of the gland into the stroma, as described in chronic glandular endometritis. These growths are very vascular, and as the stroma is often loosely disposed capillary hæmorrhages are frequent. These appearances are then rather those of new growth than

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of inflammation. They do not show small round-celled infiltration of the stroma, or degenerative changes in the glandular epithelium and blood vessels.

FIG. 7.—Benign Adenoma Uteri—multiple diffuse growths removed. Epithelium cubical, in single layer; dilated gland spaces.

Sometimes these growths are found singly in the uterus, and may attain a considerable size. They may become pedunculated, and be extruded at the external os. They are then clinically termed "mucous polypi." The largest sessile growth of this kind that I have observed

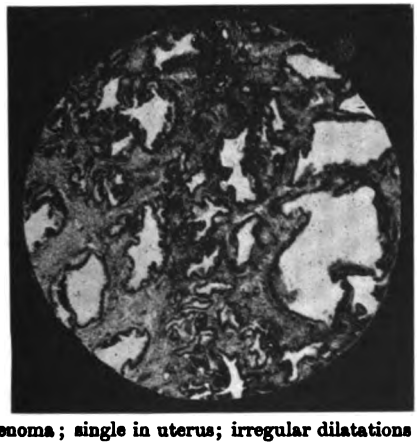

FIG. 8.—Benign Adenoma; single in uterus; irregular dilatations of glandular spaces.

was the size of an almond ($\frac{3}{4}$ inch long and $\frac{1}{2}$ inch broad), the rest of the endometrium was smooth and appeared to be healthy (Fig. 8).

This diffuse adenomatous growth of the endometrium is often associated with or supervenes upon chronic endometritis. In other cases

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it occurs without any obvious cause or history of preceding inflammation. It produces irregular and often continuous hæmorrhage, and may closely resemble the early symptoms of malignant disease.

The diagnosis can usually be made with certainty by the microscope.

Fibro-Adenoma.—These growths are not often met with. In the small multiple adenomata, just described, a little fibrous tissue may be sometimes discovered; but the stroma is mainly composed of large round and spindle cells. In the fibro-adenoma the tumour is usually much larger, and its main bulk is made up of fibrous connective tissue, with numerous glands. These growths are usually single, and may attain a large size, filling up the uterine cavity and forming a polypus. I recently removed a typical growth of this nature from an unmarried woman, aged 29 years. It had caused menorrhagia and irregular hæmorrhage for three years. The tumour was pedunculated and lobulated, and was the size of a large walnut. Microscopically, it is seen to be covered by a layer of cubical epithelium. Beneath this is a vascular stroma of round cells, with numerous glands. The bulk of the tumour is, however, made up of fibrous tissue, with few vessels. The glands are large and tortuous, and in some parts have formed small cysts. The epithelium is proliferating in many places, but does not extend into the stroma. The glands are very numerous near the surface of the growth, and are more scanty in the fully-formed fibrous tissue.

Capillaries are numerous in the round-celled tissue, which forms a layer close to the surface; and it is in this area apparently that active growth goes on.

These growths are benign, and do not usually recur after removal.

We may now pass to the appearances presented by curetted fragments in cases of malignant disease of the uterine body. If we exclude sarcoma and the rare disease "deciduoma malignum," we have two main types of malignant growth in the uterine cavity. Clinically they present similar symptoms, and are only distinguishable by the microscope. In their early stages, however, these symptoms are similar to those met with in the various forms of benign growth just considered, and hence the microscopic examination becomes of greater importance in many cases. The question is still further complicated by the fact that the disease is, in the first place, a local one, and that very often the whole of the uterine mucous membrane is affected with endometritis. Thus many of the curetted fragments removed from a malignant case may only show the signs of chronic inflammation or of benign adenomatous outgrowths. For these reasons, then, in a doubtful case all the fragments removed should be examined microscopically. At first sight this may seem to be a very laborious undertaking; but if the fragments are embedded in

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celloidin, a large number may be cut and examined in one section, and so the time needed for a thorough examination is not very great.

Carcinoma or Epithelioma.—In this form the growth probably commences in the epithelium lining the body of the uterus. It may appear as a polypoid mass, or as a diffuse infiltration of the mucosa forming small nodular projections into the body of the uterus. The epithelium forms solid columns of cells, which grow down into the mucous membrane, and rapidly spread to the muscular coat. Microscopically, we find large alveoli completely filled with epithelioid cells, as found in cancer in other parts of the body. The cells are of large size, with oval nuclei; they stain very deeply, and have a granular appearance.

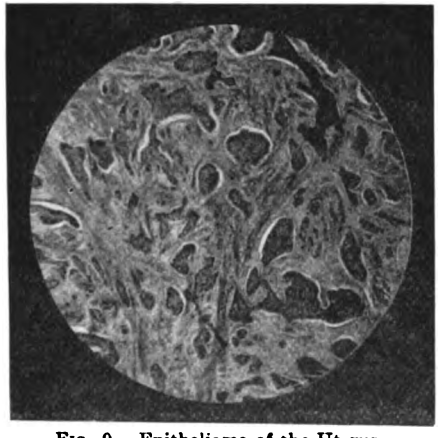

FIG. 9.—Epithelioma of the Uterus.

The stroma is often organised into fibrous tissue with extensive round-celled infiltration, but in fragments of fully developed growth the stroma is very scanty. In very rare instances squamous-celled epithelioma has been seen in the uterus, showing cell-nests. The appearance of fragments in these cases is typical, and a positive diagnosis can usually be given from microscopic evidence alone.

Malignant Adenoma, or Adeno-Carcinoma.—In this form the growth may more or less closely resemble the appearances found in benign adenoma or chronic inflammation, and it is probable that many cases have their origin in long continued inflammatory processes, which may eventually become malignant. The disease commences in the uterine glands. These are seen to be greatly increased in number, and closely crowded together with little intervening cellular tissue. They are often arranged in long parallel tubules, or the sections of the glands may be circular or oval. The epithelium stains deeply; the nuclei are very granular. The cells may be arranged in a single layer, but in many alveoli they

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are in several layers, and may be seen to project with irregular foldings into the lumen. In other parts of the sections the cells may be seen to have burst through the walls of the alveoli, and grown actively into the

FIG. 10.—Glandular Carcinoma of Uterus; alveoli fitted with epithelial cells.

stroma as solid epithelial masses; and hence, scattered throughout the sections, we find the alveoli completely filled with cells as in ordinary epithelial cancer.

FIG. 11.—Malignant Adenoma Uteri, showing parallel columns of tubules, with active glandular growth and proliferation of cells.

The stroma is loosely arranged, and often shows a large number of irregularly shaped nucleated cells with areas of round-celled infiltration. The blood vessels are well developed, and often show endarteritis. Interstitial hæmorrhages are common.

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This growth rapidly invades the muscular coat, and numerous branching alveoli, or parallel columns of tubules, may be seen spreading between the bundles of muscular fibre.

There are some cases in which the type of growth very closely simulates that met with in benign adenoma, and in these the only absolute test of malignancy is found in the extension of the growth into the muscular coat of the uterus. On the other hand, many instances of malignant adenoma much resemble the appearances of ordinary carcinoma, and between these two extremes many variations are found.

One of the most difficult problems that we may be called upon to solve by the microscope is the differential diagnosis of bènign or inflammatory uterine growths from malignant adenoma or carcinoma.

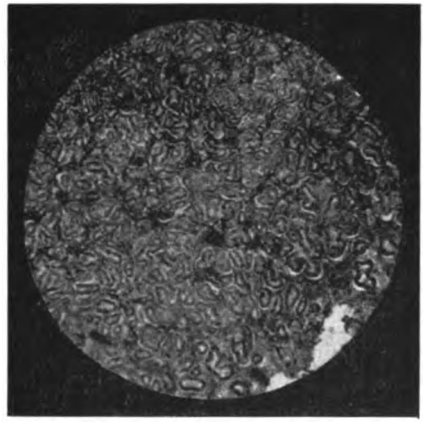

FIG. 12.—Malignant Adenoma Uteri; the gland tubules closely crowded together.

If we contrast the appearance met with in the two conditions, it will be found that many of the points of distinction are mainly differences of degree. Thus, we may have epithelial proliferation and formation of solid cellular projections in chronic glandular endometritis. The surface epithelium may also be retained for a considerable time in malignant adenoma and carcinoma.

The chief characteristics of a malignant growth may be summed up as follows:—

(1) Many alveoli are seen to be completely filled by cells, which also markedly invade the stroma.

(2) The glandular spaces are very numerous, much branched, or may be in parallel columns. The lining epithelium may be much convoluted.

(3) The stroma is scanty, contains large nucleated spindle cells, and is very vascular.

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(4) The muscular wall of the uterus is invaded by the growth, so that in curetted fragments the presence of unstriped muscular fibre may often be recognised.

(5) The amount of growth removed by the curette is usually more abundant than in benign tumours. This feature, however, is by no means always to be relied upon.

If attention be given to these points, and the observations be made by one who is accustomed to this kind of work, an exact diagnosis may, in the great majority of cases, be made by microscopic evidence only. It must, however, be admitted that in a few cases the type of growth in malignant adenoma may so closely simulate benign hypertrophy of the glands that the microscope is unreliable. Fortunately, in these cases the clinical signs will usually give great assistance in coming to a decision as to the nature of the growth.

Finally, it must be remembered that in some instances of apparently benign adenoma there is a great tendency to recurrence after removal, and the cases may eventually become malignant adenoma.

Sarcoma.—This is very rare in the body of the uterus. It usually commences as a diffuse growth under the lining epithelium, and causes irregular soft projections into the uterine cavity. These masses are usually small, but may become polypoid, and even project at the external os. Fibro-sarcoma may also develop in the uterine muscular wall, and project into the cavity, forming a polypus.

Microscopically, curetted fragments show a diffuse growth in the mucosa of round or spindle cells, as in sarcoma elsewhere. These cells surround the glands, which may entirely disappear. The blood vessels are numerous, and hæmorrhages into the sarcomatous tissue are usually seen.

The only condition likely to be mistaken for sarcoma uteri is a form of interstitial endometritis, in which numerous large cells develop in the stroma. This type of endometritis is often seen in cases of cancer of cervix, and it has been maintained (Abel) that diffuse sarcoma is often present in these cases. This is, however, not true. In inflammatory conditions the cells are not closely crowded together, with absence of intervening tissue, as in sarcoma; nor is there any invasion of the muscular wall.

Carcinoma can only be distinguished from sarcoma by the microscope, and, as they are equally malignant, exact diagnosis is not of so much importance. In sarcoma, also, it is not unusual to find epithelial masses of cells closely resembling carcinoma; so that some authorities have described a mixed form of growth. (Pozzi.)

Deciduoma Malignum.—This name has been applied to a form of malignant disease arising in connection with a previous intra-uterine

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pregnancy, and developing more especially after the formation of a hydatid mole (50 per cent of the cases). It is characterised by the presence of masses of growth in the uterus, which on section are seen to be made up to a large extent of irregular masses of protoplasm, each containing many nuclei. Between these are numerous small cells, and a loose vascular stroma. The appearances, in the recorded cases, have been quite characteristic, and by the microscope a positive diagnosis may be made. The origin of these multinuclear ill-defined cells is still uncertain. Probably a large number of the cases are examples of rapidly growing sarcoma of the uterus, having its origin in the decidua. On the other hand there is some evidence in favour of their development from the fœtal epiblast of the chorionic villi. If this is the case the growth should be classed as an epithelioma.

All cases of irregular hæmorrhage in the puerperium, or after molar pregnancy, should be carefully watched, and any masses expelled or removed from the uterus examined microscopically. This is of special importance, inasmuch as early diagnosis and complete removal of the disease gives the only chance of cure.

In this paper I have limited myself almost entirely to the microscopic appearances in the various forms of intra-uterine diseases. It is essential that in every case full advantage be taken of the clinical signs and symptoms. In many cases, more especially with regard to the diagnosis of malignancy, these may fail us, and it is in these cases that the microscope has a great sphere of usefulness, and often gives conclusive results. The examination of curetted fragments from the uterus, upon which we mainly rely for microscopic observation, is by no means a perfect method of investigation, and thus sometimes it is impossible to give a satisfactory diagnosis, but these instances are few in number, and will be rarer as our knowledge becomes more perfect.

In conclusion, I wish to express my thanks to Professor Sinclair for his courtesy in allowing me to avail myself of the pathological material from cases under his care, in making these observations.

A Method of Preparing Curetted Fragments or Section of Uterine Mucous Membrane for Microscopic Examination.—The specimen immediately after removal (1) is well washed in water and placed in alcohol 50 per cent. (2) Twenty-four hours later it is transferred to absolute alcohol for two to three days. (3) Place in equal parts of alcohol and ether for 24 hours. (4) Place next in a weak solution of celloidin for 24 hours; then to a stronger solution of celloidin in ether 24 hours. (5) The specimen is then placed on a piece of cork and dropped into methylated spirit, where it may remain some days. (6) The sections are cut by freezing in gum; stained with hæmatoxylin and eosin, and mounted in zylol balsam.

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This is the mode of procedure which I have adopted for making permanent preparations. If it is necessary to give an opinion at once, the method introduced by Cullen gives good results.

The fresh specimen is washed in water and cut with a freezing microtome. The sections are then placed in formalin (5 per cent solution) for three minutes, then transferred to alcohol (50 per cent) for three minutes, and finally to absolute alcohol for one minute. They are then washed in water, stained with hæmatoxylin and eosin, and mounted in zylol balsam.

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THE NEW BRITISH PHARMACOPŒIA.

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(Continued from Page 21.)

CHANGES IN DOSE AND STRENGTH.

Some of the most important changes in the British Pharmacopœia of 1898 relate to dose and strength. Until 1867 no indication of dose was given in the Pharmacopœia. According to Sir Richard Quain, the desirability of appending a dose to each drug and preparation was impressed on the Pharmacopœia Committee when it was proposed in 1867 to introduce arsenate of iron. To make official such a preparation without some indication of the dose was not considered safe; whilst there were manifest objections to stating the dose of some drugs and not of others. Eventually it was decided to append to each drug and preparation an indication of the amount in which it is ordinarily given. But it was expressly stated that the quantities appended were intended

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to represent *average doses in ordinary cases for adults.* "They are not authoritatively enjoined by the Council, and the practitioner must rely on his own judgment, and act on his own responsibility in graduating the doses of any therapeutic agents which he may wish to administer to his patients."

According to the preface, therefore, it was not proposed to append the maximum and minimum doses, but only the range of the average dose. Whilst, however, in some cases the average range was given, in others the amount set forth hardly indicated the average quantities administered in ordinary cases. The dose of perchloride of mercury, for example, was stated to be $\frac{1}{16}$ to $\frac{1}{8}$ of a grain. Now, though $\frac{1}{8}$ of a grain and even larger amounts have been given, this quantity cannot be said to represent the usual dose in ordinary cases. On the other hand, smaller doses than $\frac{1}{16}$ of a grain have been very commonly employed.

In the Pharmacopœia of 1885 but little change was made in the posology, though the explanation as to what the doses were meant to indicate was left unchanged.

Considerable inconvenience has arisen from the want of accord between the statement in the preface and the doses named in the text; and students have been much puzzled by noting that the doses committed to memory with such pain and trouble are, in many cases, not those usually employed by practitioners.

Another difficulty has been felt alike by medical men and students. There has been no uniformity between the doses of the same class of preparations. A glance at the table of tinctures will illustrate this. It will be seen that there were in the Pharmacopœia of 1885 fifteen different doses of tinctures.

In many cases, too, the amount of the active ingredient contained in the doses given for a drug and for its various preparations has differed very widely.

In the Pharmacopœia of 1898 it is again stated in the preface that the doses are meant to represent the average range in ordinary cases for adults. But the posology has been brought more into accordance with this statement and with the ordinary practice of the present time. The doses of similar preparations are more uniform, and the disparity in active ingredients between the doses of different preparations of the same drug is diminished.

In previous pharmacopœias two ranges of doses have in a few cases been given for a drug, according to the purpose for which it is used, *e.g.*, an expectorant and emetic dose is given for tartarated antimony. In the Pharmacopœia of 1898 a distinction has also been made in a few instances between doses for continued administration and single doses. When one or two doses are given for a special purpose, as in the case of

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aperients and anti-spasmodics, the dose is, of course, usually much larger than when such drugs are given continuously at regular intervals, and it is manifest that the extremes of the average dose in such cases may vary so widely as to give no useful information as to the real dose of the drug.

I propose to indicate the chief alterations in dose and strength which will be found in the new Pharmacopœia, since changes of this kind are of most interest to medical practitioners.

In the case of crude drugs, though uniformity in dosage is, of course, unattainable, it has been found possible to diminish the number of variations in the range of doses given, and at the same time to bring the posology more in accordance with ordinary practice. Formerly there were twenty-two variations in the doses, now there are only twelve.

The following is a list of thirteen substances which had nine different doses in the Pharmacopœia of 1885, and have now only two:—

	B. P., 1885. Grains.		B. P., 1898. Grains.
Barbadoes aloes	2— 6	...	2— 5
Socotrine „	2— 6	...	2— 5
Camphor	1—10	...	2— 5
Colchicum corms	2— 8	...	2— 5
Eucalyptus gum	2—10	...	2— 5
Santonin	2— 6	...	2— 5
Ammoniacum	10—20	...	5—15
Asafetida	5—20	...	5—15
Balsam of Peru	10—15	...	5—15
Balsam of tolu	10—15	...	5—15
Catechu	10—30	...	5—15
Bile	5—10	...	5—15
Guaiacum resin	10—30	...	5—15

In all these cases the new dose appears more in accordance with present practice than the old. For example, camphor, given in the crude form, is more commonly used in doses of 2 to 5 grains than either 1 or 10 grains; the latter amount can be in no sense regarded as an average dose. Ammoniacum has not in recent years been ordinarily given in 20 grain doses. The amounts contained in the official doses of the mixture are from 7 to 14 grains. The dose of bile has been raised. It is not much used, but when it is employed 15 grains is not an uncommon dose.

Many of the changes made in the doses of other crude drugs do not require notice, because they are so rarely given; two or three, however, are worthy of note.

The dose of gamboge has been decreased from 1—4 to ½—2 grains, and that of opium from ½—3 to ½—2. The time when 4 grains of gamboge

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was an average dose in ordinary cases must have long gone past, and 3 grains of opium, though occasionally given, must be regarded as an exceptional rather than an ordinary amount for administration. The tendency in the revision of the Pharmacopœia has been to decrease rather than increase the dosage, but changes in the other direction will be not infrequently noted. Charcoal has been raised from 20—60 to 60—120 grains (two or three teaspoonfuls are commonly taken); and ergot from 20—30 to 20—60 grains. In the case of rhubarb, of which the dose was formerly marked as 5 to 20 grains, two doses are now given, viz., 3 to 10 grains for regular administration, 15 to 30 for a single occasion.

Changes in the doses of chemical substances are very numerous, and it has not been found possible to diminish the variations in dose ranges to such an extent as in the case of the vegetable drugs, but something has been done in this direction.

Acetanilide: The dose has been decreased from 3—10 to 1—3 grains. That of phenazone has been slightly raised; it is now 5 to 20, instead of 3 to 20.

Acetic acid (dilute): In the last Pharmacopœia the dose of dilute acetic acid was raised from 1 to 2 drachms to 1 drachm to 1 ounce. It can hardly be said that the latter is an ordinary dose, and ½ to 2 drachms is now specified as the dose range.

Arsenious acid: The ordinary maximum is made $\frac{1}{15}$ instead of $\frac{1}{12}$ of a grain, the minimum being, as before, $\frac{1}{60}$.

Boric acid: The maximum dose given for boric acid (30 grains) was very high for continued use; the dose now stated is 5 to 15 grains.

Citric and tartaric acids are each altered from 10—30 to 5—20 grains.

Gallic and tannic acids: Gallic is raised from 2—10 to 5—15 grains, whilst the largest average dose of tannic acid is decreased from 10 to 5 grains. Fifteen grains is by no means a large dose of gallic acid, whilst few could take 10 grains of tannic acid without discomfort.

Hydrobromic acid (dilute): The larger dose has been slightly raised from 50 to 60 mimims, the smaller remains at 15.

The doses of the other mineral acids have been simplified, as will be seen from the following table:—

	B. P., 1885. Minims.		B. P., 1898. Minims.
Dilute hydrochloric acid.....	10—30	...	5—20
„ nitric acid	10—30	...	5—20
„ nitro-hydrochloric acid..	5—20	...	5—20
„ phosphoric acid	10—30	...	5—20
„ sulphuric acid	5—30	...	5—20
Aromatic sulphuric acid	5—30	...	5—20

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Dilute hydrocyanic acid: The larger dose has been decreased from 8 to 6 minims. It is quite exceptional to see more than 6 minims ordered.

Ether and acetic ether have had appended single doses as well as doses for regular administration.

Alum had formerly a dose of from 10—20 grains; a larger range than that now given (5—10) is only rarely employed.

Benzoate of ammonia is more often given in from 5—15 grain doses, the dose now specified, than in 10 to 20 grain doses, the range given in the Pharmacopœia of 1885.

Ammonium and sodium bromide: A smaller dose—2 to 20 grains—was given for ammonium than the other bromides in the 1885 Pharmacopœia. It is now made like that of potassium bromide, 5 to 30, and the dose of sodium bromide, formerly 10 to 30 grains, is also now made 5 to 30 grains.

Antimony compounds: Antimony oxide and sulphurated antimony are probably at the present time hardly ever ordered, but they enter into compounds formerly much prescribed and still used—pulvis antimonialis and Plummer's pill. The doses of the two substances (1 to 2 grains) have been arranged so as to agree with the doses in which the compounds are usually given.

The diaphoretic dose of tartar emetic has been reduced from $\frac{1}{16}$—$\frac{1}{6}$gr. to the more ordinarily used amounts of $\frac{1}{24}$ to $\frac{1}{8}$.

Nitrate of silver is not unfrequently given in doses as high as $\frac{1}{2}$ grain, and $\frac{1}{4}$ to $\frac{1}{2}$ grain is now set forth instead of $\frac{1}{6}$ to $\frac{1}{3}$ of a grain.

Borax has had its average maximum dose reduced from 40 to 20 grains; the larger dose was capable of causing considerable stomach irritation.

Chloral hydrate and butyl chloral hydrate have now the same dose, 5 to 20 grains. The ordinary maximum dose here given is, no doubt, often exceeded in the case of chloral hydrate. It is difficult to decide what may be called the average maximum dose, but 20 grains seems to be the maximum which is absolutely safe.

Chloride of calcium is now not unfrequently given in much larger doses than formerly, and the dose has been raised from 3—10 to 5—15 grains.

Oxalate of cerium has had its dose considerably raised from 1—2 grains to 2—10 grains. It has been found that the greater quantity checks sickness when a small dose fails, and even more than 10 grains can be given without any fear of evil effect.

Chloroform has had the dose reduced from 3—10 to 1—5 minims

Cocaine hydrochloride has likewise had its maximum dose diminished from 1 to $\frac{1}{2}$ a grain.

Creosote, on the other hand, has now a maximum of 5 instead of 3

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minims. It is given occasionally in much larger doses, but their use is not sufficiently extensive for indication in the pharmacopœia as "ordinary."

Perchloride of mercury and the red iodide have now the same dose—$\frac{1}{32}$ to $\frac{1}{16}$ of a grain. There can be little doubt that in a very large majority of cases the doses given are within this range; exceptions are perhaps frequent, and one will be again alluded to when speaking of Donovan's solution.

Mercury and chalk has hitherto had a dose of 3 to 8 grains, but the range of 1 to 5 now given seems to be the most common.

Preparations of magnesia have had a single aperient dose, as well as one for regular administration, allotted to them.

Pepsin has had its dose increased from 2—5 to 5—10 grains.

Chlorate of potash is capable, in large and continued doses, of causing evil effects in susceptible people, and it has been considered that 5 to 15 grains is a sufficient average dose in ordinary cases. In the Pharmacopœia of 1885 the dose was 10 to 30 grains.

Iodide of potassium and iodide of sodium have now a dose of 5 to 20 grains, instead of 2 to 20 and 3 to 10, respectively, larger doses being now given than in earlier times.

Sodium arsenate is decreased in dose from $\frac{1}{16}$—$\frac{1}{8}$ of a grain to $\frac{1}{40}$—$\frac{1}{10}$

The benzoate, bicarbonate, and hypophosphite of sodium all undergo some decrease in dose.

Sodium nitrite had formerly a dose of 2 to 5 grains, but 5 grains of the pure salt have not infrequently too powerful an effect, and the dose now given is 1 to 2 grains.

The phosphate and sulphate of sodium, like the magnesium preparation, have doses given for regular use, as well as for occasional administration.

Strychnine has had its official dose reduced from $\frac{1}{30}$—$\frac{1}{12}$ to $\frac{1}{60}$—$\frac{1}{15}$.

Sulphonal has now an official dose of 10 to 30 grains, instead of 15 to 40.

Most of the changes in the drugs and chemicals have been alluded to, but a few of the minor ones have not been mentioned, and two or three will be noticed in dealing with the preparations.

Changes have been made in the doses of various classes of preparations quite as considerable as those that have been pointed out in drugs and chemical substances, and some of the changes introduced for the sake of uniformity in dosage have necessitated alterations in strength.

The amount of active ingredient contained in the doses given for preparations of the same drug will be found much more equal than in previous pharmacopœias. It is not, of course, possible to avoid some disparity, for the various preparations of a drug are not infrequently

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used for different purposes, and the power of an active principle is modified by the conditions under which it exists in a preparation. The amount of an active principle in the dose of a tincture or infusion is, at times, very much less than the quantity contained in an equivalent dose of the crude drug, and yet the dose of the tincture or infusion may be as effective for the purpose for which it is given as the crude drug.

The tinctures have undergone much change in dose and strength, as will be seen from the following table:—

	B. P., 1885.	B. P., 1898.	Remarks.
Tinct. aconiti	5—15 m.	5—15; 2—5 m. if frequently repeated	1 : 20 instead of 5 : 40
„ aloes	1—2 fl. dr.	½—1 fl. dr.; 1½—2 fl. dr. if single dose	Strength unaltered.
„ arnicæ	½—1 fl. dr.	No dose given	Strength unaltered.
„ asafetidæ	½—1 fl. dr.	½—1 fl. dr.	Strength 1 : 5 instead of 1 : 8.
„ belladonnæ	5—20 m.	5—15 m.	Made from liquid extract of belladonna instead of leaves.
„ benzoini co.	½—1 fl. dr.	½—1 fl. dr.	Strength unaltered, 1 : 10.
„ buchu	1—2 fl. dr.	½—1 fl. dr.	1 : 5 instead of 1 : 8.
„ calumbæ	½—2 fl. dr.	½—1 fl. dr.	1 : 10 instead of 1 : 8.
„ camphoræ co.	15 m.—1 fl. dr.	½—1 fl. dr.	Strength unaltered.
„ cannabis indicæ	5—20 m.	5—15 m.	Strength unaltered, 1 : 5.
„ cantharidis	5—20 m.	5—15 m.; 2—5 m. if repeated	Strength unaltered, 1 : 80.
„ capsici	10—20 m.	5—15 m.	1 : 20 instead of 1 : 26.
„ cardamomi	½—2 fl. dr.	½—1 fl. dr.	Strength unaltered.
„ cascarillæ	½—2 fl. dr.	½—1 fl. dr.	1 : 5 instead of 1 : 8.
„ catechu	½—2 fl. dr.	½—1 fl. dr.	1 : 5 instead of 1 : 8.
„ chiratæ	½—2 fl. dr.	½—1 fl. dr.	1 : 10 instead of 1 : 8.
„ chlorof. et morphinæ co.	5—10 m.	5—15 m.	Much altered; morphia increased from $\frac{1}{8}$ to $\frac{1}{4}$ gr. in 10 m.
„ cimicifugæ	15—60 m.	½—1 dr.	1 : 10 instead of 1 : 8.
„ cinchonæ	½—2 dr.	½—1 dr.	Strength unaltered.
„ cinchonæ co.	½—2 dr.	½—1 dr.	Made with tincture.
„ cinnamomi	½—2 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
„ cocci	No dose	5—15 m.	1 : 10 instead of 1 : 5.
„ colchici seminum	10—30 m.	5—15 m.	1 : 5 instead of 1 : 8.

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	B. P., 1885.	B. P., 1898.	Remarks.
Tinct. conii	20—60 m.	½—1 dr.	1 : 5 instead of 1 : 8.
„ croci	No dose	5—15 m.	Strength unaltered.
„ cubebæ	½—2 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
„ digitalis	10—30 m.	5—15 m.	Strength unaltered 1 : 8.
„ ferri perchlor.	10—30 m.	5—15 m.	Strength unaltered.
„ gelsemii	5—20 m.	5—15 m.	1 : 10 instead of 1 : 8.
„ gentianæ co.	½—2 dr.	½—1 dr.	1 : 10 instead of 3 : 40.
„ guaiaci ammon.	½—1 dr.	½—1 dr.	Strength unaltered 1 : 5.
„ hamamelidis	5—60 m.	½—1 dr.	Strength unaltered 1 : 10.
„ hydrastis	20—60 m.	½—1 dr.	Strength unaltered 1 : 10.
„ hyoscyami	½—1 dr.	½—1 dr.	1 : 10 instead of 1 : 8.
„ iodi	5—20 m.	2—5 m.	Strength unaltered 1 : 40.
„ jaborandi	½—1 dr.	½—1 dr.	1 : 5 instead of 1 : 4.
„ jalapæ	½—2 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
„ kino	½—2 dr.	½—1 dr.	Strength unaltered 1 : 10.
„ krameriæ	½—2 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
„ lavand. co.	½—2 dr.	½—1 dr.	Strength unaltered.
„ limonis	½—2 dr.	½—1 dr.	1 : 4 instead of 1 : 8.
„ lobeliæ ætherea	10—30 m.	5—15 m.	1 : 5 instead of 1 : 8.
„ lupuli	½—2 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
„ myrrhæ	½—1 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
„ nucis vomicæ	10—20 m.	5—15 m.	0·25 per cent of strychnine, about twice strength of old.
„ opii	5—40 m.	5—15 m.; 20—30 m. for single dose	Strength unaltered.
„ opii ammon.	½—1 dr.	½—1 dr.	Strength of opium unaltered.
„ podophylli	15—60 m.	5—15 m.	Double the strength of old.
„ pyrethri	No dose	No dose	Strength unaltered.
„ quassiæ	½—2 dr.	½—1 dr.	1 : 10 instead of 1 : 26.
„ quininæ	½—2 dr.	½—1 dr.	⅒ stronger than old.
„ quininæ ammon.	½—2 dr.	½—1 dr.	⅒ stronger than old.
„ rhei co.	1—2 dr.; 4—8 dr. for single dose.	½—1 dr.; 2—4 dr. for single dose.	Strength unaltered 1 : 10.
„ scillæ	10—20 m.	5—15 m.	1 : 5 instead of 1 : 8.

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	B. P., 1885.	B. P., 1898.	Remarks.
Tinct. senegæ ...	½—2 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
,, sennæ co.	1—4 dr.	½—1 dr.; 2—4 dr. single dose	1 : 5 instead of 1 : 8.
,, serpentariæ	½—2 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
,, stramonii	10—30 m.	5—15 m.	1 : 5 instead of 1 : 8.
,, strophanthi	2—10 m.	5—15 m.	½ strength of old.
,, sumbul	10—30 m.	½—1 dr.	1 : 10 instead of 1 : 8.
,, tolutana	20—40 m.	½—1 dr.	1 : 10 instead of 1 : 8.
,, valerianæ ammon.	½—1 dr.	½—1 dr.	1 : 5 instead of 1 : 8.
,, zingiberis	15—60 m.	½—1 dr.	1 : 10 instead of 1 : 8.

It will be observed that with one exception the doses of the tinctures are either 5 to 15 minims or ½ to 1 drachm. In making the changes of strength necessitated by the change in doses, a percentage relation between the menstruum and the drug has, in most instances, been instituted. Instead of the proportion of drugs to spirit being 1 part to 4, 1 part to 8, and 1 part to 26, as in the Pharmacopœia of 1885, we have 1 part to 5, 1 part to 10, and 1 part to 20, that is tinctures of a strength of 20, 10, and 5 per cent.

In all but three of the official tinctures (the compound tincture of benzoin, ammoniated tincture of guaiacum, and ammoniated tincture of opium) changes have been made either in strength or dose. In two others (hydrastis and jaborandi) the dose and strength are practically unaltered.

The dose has been lessened in a large number of instances. At the present time tinctures, except when given for a special purpose, are rarely ordered in doses of more than one drachm, and this amount has been made the limit of the average dose of a considerable number of the less potent tinctures.

In the case of some of these—as aloes, cardamoms, kino, lavender, rhubarb, and the cinchona tinctures, it has not been thought necessary to alter the strength of the tinctures, but in 17, viz. buchu, cascarilla, catechu, cinnamon, colchicum, cubebs, jalap, krameria, lemon, lobelia, hop, quassia, senega, squill, serpentary, stramonium, and compound tincture of senna the decreased dosage is accompanied by an increase in strength, the proportion of drug to spirit being raised from 1 to 8 to 1 to 5. In the quinine tinctures the reduction of dose is accompanied by a very slight increase in strength, amounting to not more than $\frac{1}{10}$ of a grain per drachm.

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There are several other instances besides those already alluded to of the dose of tinctures being lessened whilst the strength is either unaltered or raised, and some of these are worthy of note. The tinctures of cannabis indica, cantharides, perchloride of iron, and iodine have smaller doses allotted to them than in the previous pharmacopœia, though their strength is not increased.

The reduction of the maximum dose of the tinctures of cannabis indica and cantharides from 20 to 15 minims accords with ordinary practice, for few give these drugs in ordinary cases in larger doses than 15 minims, but exception may be taken to the decrease in the doses of tinctures of digitalis and perchloride of iron, both of which are now half what they were. Nevertheless it cannot be doubted that both these tinctures are most frequently prescribed within the range now given; 20, 30, and even 60 minims of both are, indeed, from time to time ordered, but rarely as compared with the number of times in which doses of from 5 to 15 minims are prescribed.

A great reduction has been made in the maximum dose of the range given for tincture of opium; 40 minims and even larger quantities are from time to time administered; but it can hardly be said that 40 minims is an average dose in an ordinary case. Fifteen minims is probably not usually exceeded when laudanum is given at regular intervals.

Some difference of opinion may prevail with regard to the dose of tincture of iodine, which has been greatly reduced. Undoubtedly, doses of 5 to 20 minims are occasionally given; but there is no evidence that such doses are largely used.

The tinctures of capsicum, belladonna, nux vomica, and podophyllum, in addition to those already mentioned, have been decreased in dose and increased in strength.

Tincture of belladonna has hitherto varied greatly in strength, in part owing to the fact that the amount of alkaloid in the root is not always the same. Cripps in 1888 examined six specimens of tincture of belladonna, and found that the amount of alkaloid varied from ·006 to ·026 per cent; that is, he found that one tincture might contain four times as much as another. The tincture, as prepared according to the formula of the 1898 Pharmacopœia from a liquid extract (so made as to contain exactly $\frac{3}{4}$ per cent of total alkaloid) will, in future, contain ·048 to ·052 per cent of total alkaloid. Now the average of good specimens of the old tincture may be taken as ·025 per cent. Farr and Wright found an average of ·025 per cent in twelve samples of tinctures made by themselves. Hence it may be considered that the present tincture, which may be looked on as containing ·05 per cent of alkaloids, is double the strength of the old tincture. By diminishing somewhat the doses of

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tincture of belladonna and raising its strength and revising the dosage of atropine and its solution, the amount of alkaloids in the doses of the tincture have been brought into uniformity with the amount in the doses of other preparations of belladonna. In the Pharmacopœia of 1885 no dose was given for sulphate of atropia, but that of liquor atropinæ sulphatis was stated to be 1 to 4 minims, equivalent to $\frac{1}{100}$ to $\frac{1}{25}$ of a grain of atropia. It cannot, however, be held that $\frac{1}{25}$ of a grain of atropia is an ordinary dose of this alkaloid; and in the Pharmacopœia of 1898 $\frac{1}{200}$ to $\frac{1}{100}$ of a grain is set forth as the dose of atropia. Now, had the strength of the tincture of belladonna been made ·025 per cent, 15 minims would have corresponded to about $\frac{1}{300}$ of a grain; that is, the highest dose of the tincture would have been considerably less than the lowest dose mentioned for sulphate of atropia. By making the tincture of a strength of ·05 per cent of alkaloids, 5 to 15 minims of the tincture corresponds to $\frac{1}{400}$ to $\frac{1}{150}$ of a grain.

It may be of service to point out that, though the quantity of the alkaloids in the succus is variable, good samples seem to contain ·03 to ·06 per cent, and the average seems about ·048. Thus the strength of the present tincture corresponds to that of the succus, and the doses of the two, it will be found, are the same. In the British Pharmacopœia of 1885 the doses differed, that of the tincture being 5 to 20, and of the succus 5 to 15. Though the largest dose of the tincture now indicated is not equivalent in alkaloidal strength to 1 minim of the liquor atropinæ sulphatis, it must be borne in mind that the present tincture will have to be used more carefully than that of previous pharmacopœias. A few minims more or less of a tincture which often varied greatly in strength was usually of no consequence, but the increase of a dose of the present tincture by a few minims might readily lead to the advent of toxic symptoms.

Tincture of nux vomica, like tincture of belladonna, has been lessened in dose and doubled in strength. In the 1885 Pharmacopœia the nux vomica tincture contained 1 grain per ounce of mixed alkaloids, and the dose was 10 to 20 minims, or $\frac{1}{44}$ to $\frac{1}{22}$ of a grain of mixed alkaloids.

The proportion of brucine to strychnine in nux vomica varies from 46 to 60 per cent. If we take the average as 50 per cent, the amount of strychnine in the range of dose given for the extract of nux vomica of the Pharmacopœia of 1885 was $\frac{1}{88}$ to $\frac{1}{44}$ of a grain, whilst the dose put down for strychnine itself was $\frac{1}{22}$ to $\frac{1}{11}$ of a grain. Even when we take into consideration that nux vomica is often given for other purposes than those for which strychnine and its solution are used, it is manifest there was an undue disparity in the dose given for tincture of nux vomica as compared with the doses prescribed for strychnine and its solution. In the Pharmacopœia of 1898, however, the dose set forth for strychnine

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itself is lowered to $\frac{1}{60}$—$\frac{1}{15}$ of a grain. Larger doses than $\frac{1}{15}$ are from time to time ordered; but they are the exception, not the rule. The dose of liquor strychninæ hydr. has been changed from 5—10 to 2—8 minims, corresponding to $\frac{1}{60}$ to $\frac{1}{15}$ of a grain. On the other hand, the strength of the tincture has been so raised that the dose of 5 to 15 minims corresponds to $\frac{1}{96}$ to $\frac{1}{32}$ of a grain. To prescribe the amount of tincture corresponding to the largest dose given for strychnine, 30 minims of the tincture must be ordered. The different purposes for which nux vomica preparations and strychnine itself are used account for some discrepancy between the amount of strychnine in the dose range of nux vomica and the dose of strychnine itself.

As in the case of tincture of belladonna, the new tincture of nux vomica will have to be used with greater caution than the old. It will always be found an active preparation, and in those very susceptible to the influence of strychnine the full dose of 15 minims may produce some indications of physiological effects just like those produced at times by $\frac{1}{15}$ to $\frac{1}{20}$ of a grain of strychnine.

Tincture of colchicum and the etherial tincture of lobelia have had their dose lessened 50 per cent; but, on the other hand, they are 45 per cent stronger. Tincture of podophyllum has a dose range of rather less than one-third of that prescribed in the 1885 Pharmacopœia, while its strength has only been doubled. It has long been felt that the doses of the tinctures given in the 1885 Pharmacopœia were somewhat excessive.

The decreased dose of the tincture of squill from 10 to 20 minims to 5 to 15 minims is made up for by the increased strength of the tincture.

Two tinctures remain unaltered in dose, but have their strengths diminished, viz., tincture of aconite and tincture of hemlock.

Tincture of aconite has always been a difficulty. Practically, though the dose in the pharmacopœia was 5 to 15 minims, this tincture has been usually given in doses of 1 to 2 minims every hour or two. Few probably have given more than 4 to 8 minims at intervals of three or four hours. Mr. Hutchinson says he usually orders 10-minim doses, and has only on one occasion noted poisonous symptoms after prescribing this amount. Even then he was inclined to think there was some mistake in the preparation of the tincture; but 15 minims has not been looked upon as an average dose in ordinary cases. To retain the dose of 5 to 15 minims, the strength of the tincture has been considerably lessened.

A slight diminution has been made in the strength of tincture of henbane, though the dose remains the same. A drachm of the old tincture of

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henbane has occasionally been found unduly potent. Tinctures of asafetida, myrrh, and valerian are, it will be seen, stronger than they were, though the doses remain the same. There may be some, though not a great, advantage in the increase of strength in these tinctures; but there can be no doubt of this in the case of conium, the strength of which has also been added to. The tincture of the 1885 Pharmacopœia was too weak to be of service.

There are four instances in which both the strength and dose of the tincture have been decreased, but the reduction of strength in all four cases has been slight. Three of them are bitters, viz., calumba, chirata, and gentian. The new dose, half-drachm to a drachm, is more in accordance with the present practice than the old, which was a drachm to two drachms. Gelsemium, the fourth member of this class, is a very potent drug; and 20 minims, the maximum dose named for the old tincture, was very rarely used.

Of the cases in which the dose has been increased and the strength decreased, we have five examples, viz., cimicifuga, strophanthus, sumbul, tolu, and ginger. Of these, strophanthus is the only one that calls for special notice. The dose has been altered from 2 to 10 minims to 5 to 15. On the other hand, the tincture is made with only half the quantity of strophanthus formerly used.

The range of dose of tincture of hamamelis, 5 to 60 minims, was an unusually wide one in the Pharmacopœia of 1885. By raising the minimum of the range from 5 minims to half a drachm, an indication is given that the preparation is a harmless one. The use of the drug in smaller doses by those who think it is advisable is in no way prevented. The same remarks apply to the compound tincture of camphor, where the range has been decreased from 15 minims to a drachm to ½ a drachm to 1 drachm. Half a drachm corresponds to $\frac{1}{8}$ grain of opium or $\frac{1}{80}$ grain of morphia.

Tinctura chloroformi et morphinæ co. has been greatly increased as regards the strength of the morphia. This tincture, though introduced in imitation of chlorodyne, must not be looked upon in the same light as ordinary chlorodyne. It will be noticed that chlorodyne is not marked as a synonym of this tincture. Chlorodyne being a household remedy, it is advisable that the amount of morphia contained in it should be extremely small. But the tincture of chloroform and morphia is prescribed by medical men, and for anodyne purposes, for which it is chiefly used by practitioners, the quantity of morphia contained was much too small. The increase in strength from $\frac{1}{128}$ to $\frac{1}{11}$ of a grain in 10 minims must, of course, be carefully remembered by those who use this tincture.

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The spirits, like the tinctures, have undergone considerable changes in dose and strength, and are as follow :—

	B. P., 1885.	B. P., 1898.	Remarks.
Spiritus ætheris.....	30—90 m...	20—40 m.; 60—90 m., single	
,, ætheris co.....	½—2 dr. ...	20—40 m.; 60—90 m., single	
,, ætheris nitrosi	½—2 dr. ...	20—40 m.; 60—90 m., single	
,, ammon. arom..	½—1 dr. ...	20—40 m.; 60—90 m., single	
,, ammon. fetidus	½—1 dr. ...	20—40 m.; 60—90 m., single	
,, anisi	10—20 m (essence).	5—20 m.	½ strength of old essence.
,, armoraciæ co...	1—2 dr. ...	1—2 dr.	
,, cajuputi	½—1 dr. ...	5—20 m.	5 times strength of old.
,, camphoræ	10—30 m...	5—20 m.	
,, chloroformi ...	20—60 m...	5—20 m.; 30—40 m., single	
,, cinnamoni	½—1 dr. ...	5—20 m.	5 times strength of old.
,, juniperi	½—1 dr. ...	20—60 m.	2½ times strength of old.
,, lavandulæ	½—1 dr. ...	5—20 m.	5 times strength of old.
,, menthæ piper.	½—1 dr. ...	5—20 m.	5 times strength of old sp.; ½ strength of old essence.
,, myristicæ	½—1 dr. ...	5—20 m.	5 times strength of old.
,, rosmarini	½—1 dr. ...	No dose	5 times strength of old.

It will be seen that of the 16 spirits 13 have doses of either 20 to 40 minims or 5 to 20 minims. Inasmuch as many of them are given in single doses for special purposes, the ordinary amount for a single dose is given in six instances. In the Pharmacopœia of 1885 many of the spirits had a strength of 1 part of essential oil to 50 of spirit, whilst in other cases the strength was 1 in 10 of spirit. In the Pharmacopœia of 1898 there is more uniformity of strength. All the spirits made by the solution of the oil in alcohol, except juniper, are of a strength of 1 in 10. There seems no reason for a dilution of 1 in 50.

In order to bring about this uniformity, six of them—cajuput, cinnamon, lavender, nutmeg, rosemary, and peppermint have been made five times their old strength.

In several instances, where no change of strength has been made, the minimum of the range of dose has been somewhat decreased. It is

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probable that 20 minims, for example, of aromatic ammonia or spirit of ether are more commonly prescribed than 30. Spirit of nitrous ether is popularly used in very large doses, 4 drachms being not infrequently given. But practitioners rarely give this large quantity, and, when given in mixtures combined with other diaphoretics, even drachm doses are comparatively rarely prescribed. The dose of spirit of chloroform has been considerably changed. It is far more often given in doses of 5 to 20 minims than 20 to 60 minims, and, though a drachm at a time is occasionally given, this is certainly not an ordinary dose.

Spirit of juniper is usually given for its diuretic action, and the dose of the spirit of the 1885 Pharmacopœia was often found too small for the purposes for which it was intended. It will be noted that the present tincture is 2½ times the strength of the old one, whilst the dose remains almost the same.

A considerable change has likewise been made in the strength of the extracts, as will be seen from the annexed table :—

	B. P., 1885. Grains.		B. P., 1898. Grains.
Extractum aloes barbadensis	2— 6	...	1—4
„ anthemidis	2—10	...	2—8
„ bellad. alcohol.....	1/6— ¼	...	¼—1
„ bellad. viride	¼— 1	...	¼—1
„ cannabis indicæ	¼— 1	...	¼—1
„ cascaræ sagradæ	2— 8	...	2—8
„ colchici	½— 2	...	¼—1
„ colocynthidis co.	3—10	...	2—8
„ euonymi siccum	1— 4	...	1—2
„ gentianæ	2—10	...	2—8
„ hyoscyami viride	5—10	...	2—8
„ jalapæ	5—15	...	2—8
„ krameriæ	5—20	...	5—15
„ nucis vomicæ	¼— 1	...	¼—1
„ opii.....	½— 2	...	¼—1
„ physostigminatis	1/6— ¼	...	¼—1
„ rhei	5—15	...	2—8
„ stramonii	¼— ½	...	¼—1
„ taraxaci.....	5—30	...	5—15

With four exceptions, the dose of 19 extracts is either ¼ to 1 grain or 2 to 8 grains.

The dose of the extract of aloes was certainly fixed too high in the Pharmacopœia of 1885. One grain is probably as common a dose as two grains, and six grains is assuredly rather an exceptional than an average dose.

It will be seen that a considerable change has been made in the strength and dose of the extract of belladonna. The old extract, now to be known as "extractum belladonnæ viride,"

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varied considerably in strength. An analysis published by Barclay in 1893 showed that the strength of alkaloid contained in seven commercial specimens of the green extract varied from ·87 per cent to 1·37 per cent. In giving a dose, then, of one grain of the green extract, we may be at one time giving $\frac{1}{115}$ grain of belladonna alkaloids and at another time $\frac{1}{75}$ of a grain. The old alcoholic extract of belladonna of 1885 was a much stronger preparation than the average green extract; but it, too, was very variable. Dunstan and Ransom showed in 1886 that the amount of alkaloids might vary from 1·65 to 4·45 per cent.

The alcoholic extract of the Pharmacopœia of 1898 will always have the same strength. Each grain will contain $\frac{1}{100}$ of a grain of belladonna alkaloids, and thus be about equivalent to 1 minim of the liquor atropine sulphatis. It may be pointed out that the alcoholic extract of belladonna is reduced to definite strength by the addition of milk sugar. In future, then, the practitioner who wishes to give belladonna in the form of extract, has the choice of two extracts which have the same dose. If he gives the alcoholic extract, he will know that in a dose of half a grain he is administering $\frac{1}{200}$ of a grain of belladonna alkaloids. If he gives the green extract, he may be giving either $\frac{1}{150}$ of a grain or $\frac{1}{230}$ of a grain.

Were it not that the green extract is so much used externally, it might well be excluded from the pharmacopœia.

It will be seen that the doses of extract of colchicum, compound extract of colocynth, hyoscyamus, and rhubarb have all been diminished somewhat. This diminution has had the effect of leading to greater uniformity in dosage and bringing the doses more into line with the ordinary usages of practice. Whatever may have been the case in former times, it is not probable that any one now gives as an ordinary dose 15 grains of extract of rhubarb. The dose of the extract of nux vomica remains the same, whilst its alkaloidal strength is reduced by one-third. It now contains 5 per cent of strychnine, and the reduction has been made in order to bring the dose of the extract more in line with the doses of the other preparations of nux vomica and strychnine. One grain of the extract now corresponds to $\frac{1}{20}$ of a grain of strychnine. The dose of extract of opium is now put down as $\frac{1}{4}$ to 1 grain, instead of $\frac{1}{2}$ to 2 grains. This brings it into line with the dose given for opium, which contains 10 per cent of morphia, whilst the extract of opium contains 20 per cent.

The strength of the extract of Calabar bean has been decreased by the addition of sugar of milk, in order to bring the dose to $\frac{1}{4}$ to 1 grain.

Extract of taraxacum has had the dose reduced from 30 to 15 grains; 30 grains could only be given in a bolus, a form of administration not often now employed. Of course, it could be rubbed up with water; but

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the liquid extract would be a more convenient form. As a fact, the extract is chiefly used as an excipient; and there is little doubt that it is one of the preparations doomed to extinction when the next pharmacopœia is issued, for we have now many substances to take its place in pill-making, and its exclusion from the pharmacopœia will not be felt.

In the waters one change alone is worthy of note. Aqua chloroformi contains only 30 minims of chloroform in 25 fluid ounces of water, or one part in 400. It is therefore exactly half the strength of the chloroform water of the 1885 Pharmacopœia. The three decoctions which are left—aloes, pomegranate, and logwood have now all the same dose, ½oz. to 2ozs. Previously each had a separate dose. The strength of the decoction of pomegranate bark is now double what it was.

The maximum dose of the infusions has been in almost every case decreased from 2ozs. to 1oz. Medical men do not now, as a rule, prescribe 2oz. doses. Far more often ½oz. only is prescribed, and the doses given for all the infusions is ½oz. to 1oz. The dose of infusion buchu, formerly 1oz. to 4ozs. is now 1oz. to 2oz., but the strength of the infusion has been doubled. Senna infusion has a dose of 2ozs. as a draught, as well as one of ½oz. for regular administration. The maximum doses of the mixtures, like those of the infusions, have for the most part been decreased from 2ozs. to 1oz.

All the subcutaneous injections are altered in strength. The hypodermic injection of apomorphia contains only 1 grain of apomorphia dissolved in 110 minims of water containing 1 minim of dilute hydrochloric acid, instead of 2 grains dissolved in 100 minims of camphor water as heretofore, and the dose for injection is now 5 to 10 minims instead of 2 to 8.

The hypodermic injection of ergot, made, as before stated, with a new extract of ergot, and preserved by the addition of a little phenol, contains 33 grs. of the extract in 110 minims. The dose is the same as that of the old hypodermic injection of ergot. The hypodermic injection of morphia has been considerably decreased in strength. Formerly 60 minims contained 6grs. of acetate of morphia, now 110 minims contain 5grs. of morphine tartrate. The dose of the injection is stated as 2 to 5 minims, the latter will contain very slightly less than ¼gr. of morphia.

The strength of the solutions containing morphine and atropine have not been materially altered, but whilst the doses of the liquor morphinæ acetatis and liquor morphinæ hydrochloratis remain as before, 10 to 60 minims, corresponding to $\frac{1}{11}$ and $\frac{6}{11}$ grs. of morphine salts, that of the liquor atropinæ sulphatis has been much lowered. It was 1 to 4 minims in the 1885 Pharmacopœia, now it is ½ to 1 minim, corresponding in strength of atropine sulphate to the dose given for the salt itself. A small quantity of salicylic acid (2grs. to 4ozs.) is used to

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prevent it from decomposition, instead of camphor water, with which it was formerly made.

The solutions of iron acetate, perchloride and nitrate have all the same dose (5 to 15 minims) like that of the tincture. Previously the first two had a dose of 5 to 30 minims, the pernitrate of 5 to 40 minims, whilst that of the tincture was 5 to 30 minims.

In accordance with the reduction made in the dose of perchloride itself, the dose range of the liquor hydrargyri perchloridi now appears as from 30 to 60 minims, $\frac{1}{3\frac{1}{2}}$ to $\frac{1}{1\frac{1}{6}}$ of a grain of perchloride, instead of 30 to 120 minims.

Liquor potassæ has now a dose of 10 to 30 minims, instead of 15 to 60. A drachm is not often administered.

The dose of liquor sodii arsenatis is made the same as that of liquor arsenicalis (2 to 8 minims): it was formerly 5 to 10 minims. Nearly all the arsenical solutions have now the same dose. The liquor arsenii et hydrargyri iodidi, commonly known as Donovan's solution, although the official synonym has now been withdrawn, is an exception, and has a larger dose allotted to it than would be expected from its strength. Formerly the dose given was 10 to 30 minims, corresponding to from $\frac{1}{11}$ to $\frac{3}{11}$ of a grain of each of the iodides, but the dose stated for arsenium iodide was $\frac{1}{30}$ of a grain, and the largest average dose given for perchloride was $\frac{1}{8}$ of a grain. It is probable that 30 minims was rarely given, but undoubtedly 10 to 20 minims is not a very uncommon dose. The range of 5 to 20 minims now set forth corresponds to $\frac{1}{24}$ and $\frac{1}{6}$ of each of the iodides. The dose of the arsenical constituent corresponds with that given for arsenium iodide, but that of the mercurial salt is much higher than the largest average dose given for the perchloride.

The doses of pill masses have been slightly modified, so that 15 out of 17 have only two ranges of doses, 4 to 8 grains and 2 to 4 grains. The exceptions are the pil. ferri and the pil. phosphori, which have doses of 5 to 15 grains and 1 to 2 grains respectively; the strength of the latter pill has been doubled, but the dose is just half what it was.

The only change worthy of note in the powders is the increase in the range given for compound liquorice powder from 30—60 to 60—120 grains.

The lamella cocainæ has now the strength of $\frac{1}{50}$ grain, instead of $\frac{1}{200}$, and it is made to differ in weight ($\frac{1}{30}$ of a grain) from all the others, which still remain at $\frac{1}{60}$ of a grain.

The directions for preparing the lozenges have been modified, and the amount of active ingredient in each has been plainly specified. It has not been considered necessary to state the number of lozenges which constitute a dose.

One suppository has been altered in strength—that of morphine, which now contains $\frac{1}{4}$ instead of $\frac{1}{2}$ a grain, as heretofore.

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The oils and ointments have been greatly changed in dose and strength. The range of dose of almost all the essential oils has been reduced from 1 to 4 minims to ½ to 3 minims.

Oleum copaibæ and oleum cubebæ are exceptions, the dose being left as before, from 5 to 20 minims. The most important dose changes have been made in phosphorated oil and oil of turpentine. Oleum phosphoratum has the same strength as heretofore; but the dose formerly given for it, 5 to 10 minims, which corresponded to $\frac{1}{20}$—$\frac{1}{10}$ of a grain of phosphorus, has been decreased to 1 to 5 minims. This is in keeping with the dose now given for phosphorus, $\frac{1}{100}$ to $\frac{1}{20}$ grain.

Oil of turpentine had formerly a dose of 10 minims to 4 drachms, without any indication being given as to the reason for this wide range. Now two doses are stated—2 to 10 minims for regular administration, and 2 to 4 drachms as an anthelmentic.

The following table indicates the nature of the changes made in the strength of the ointments:—

	B. P., 1885.		B. P., 1898.
Unguentum acidi salicylici	1 in 28	...	2 per cent.
„ aconitinæ	1 in 59½	...	2 „
„ atropinæ	1 in 59½	...	2 „
„ veratrinæ	1 in 63	...	2 „
„ acidi carbolici	1 in 19	...	4 „
„ chrysarobini	1 in 25	...	4 „
„ hydrarg. iodid. rubr. ...	1 in 28·3	...	4 „
„ iodi	1 in 31	...	4 „
„ plumbi acetatis.....	2 in 75	...	4 „
„ sulphuris iodidi.....	5 in 78	...	4 „
„ acidi borici	1 in 7	...	10 „
„ cantharidis	1 in 7	...	10 „
„ creosoti.....	1 in 9	...	10 „
„ eucalypti	1 in 3	...	10 „
„ hamamelidis (of liq.extr.)	1 in 10	...	10 „
„ hydrargyri ammon.	1 in 10	...	10 per cent.
„ hydrarg. oxidi rubr. ...	1 in 8	...	10 „
„ hydrarg. subchloridi ...	1 in 6·47	...	10 „
„ iodoformi	1 in 10	...	10 „
„ plumbi carbonatis	1 in 8	...	10 „
„ plumbi iodidi	1 in 8	...	10 „
„ potassii iodidi	16 in 141	...	10 „
„ sulphuris	1 in 5	...	10 „
„ zinci	1 in 6½	...	15 „
„ gallæ	1 in 6½	...	20 „
„ hydrarg. nitratis dil. ...	1 in 3	...	20 „
	of ung. hydr. nitrat.		of strong ointment.
„ hydrarg. comp.....	6 in 13½	...	40 per cent
	of ung. hydrarg.		of ung. hydrarg.
„ hydrargyri.....	1 in 2	...	50 per cent
	nearly.		(nearly, 48·4 p.c.)

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In prescribing ointments it is not unfrequently advantageous that the amount of active ingredient they contain should be borne in mind. To facilitate this the ointments are now in a majority of cases of a percentage strength. It will be seen that considerable changes have been made in the amount of active ingredients present in several of them.

The strength of salicylic acid ointment has been decreased from 1 in 28 to 1 in 50. Carbolic acid is now of 4 per cent strength instead of, as formerly, a 5 per cent ointment.

The ointment of boric acid has been decreased from 1 in 7 to 1 in 10, and that of eucalyptus from 1 in 3 to 1 in 10. The calomel ointment is somewhat weaker than heretofore, and the sulphur ointment is only half the strength it was.

On the other hand, the red iodide of mercury and iodine ointments and the ointment of the acetate of lead are increased in strength. Other minor changes will also be observed. A certain number of the ointments did not lend themselves to percentages, but in most of these cases no great advantage would have been gained by a percentage arrangement.

The ointment of belladonna contained 10 per cent of alcoholic extract, but as this extract had not always the same strength the amount of alkaloid contained in the ointment could not be invariable. Now it is made from the liquid extract, and will always contain 0·6 per cent of alkaloids.

The amount of opium in the unguentum gallæ cum opio is exactly the same as heretofore, and the strength in the unguentum glycerini plumbi sub-acetatis has not been altered. The changes in the other ointments are not of importance.

CHANGES IN WEIGHTS AND MEASURES.

In the Pharmacopœia of 1898 a distinct step has been taken towards the adoption of the metric system. In 1867, as before stated, it had been allowed as an alternative in the processes for volumetric estimations, and in that of 1885 proportional parts were freely introduced, as gradually leading up to the metric system. In the present Pharmacopœia this system appears in the text side by side with the imperial system, and is alone employed in all analytical operations.

The two systems cannot continuously find place in the Pharmacopœia, and eventually the metric will take the place of the imperial. The displacement of the grain, as the starting point of a system of weights, will be in many respects a loss, for in the grain and the pound (consisting of 7,000 grains) we have two absolutely accurate and useful standards. Unfortunately, however, we have no satisfactory intermediate weight, for

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the ounce, which consists of 437·5 grains, cannot be regarded as such. But the great bar to the retention of the imperial system is the fact that we have no measure of capacity which accords with the grain.

A minim is the volume, at 62° F., not of a grain but of ·911 grain of water, and 100 grains of water measure as nearly as possible 110 minims. Hence a 1 per cent solution—a solution of which 100 grains contains 1 grain of a substance—has to be expressed by saying that 110 minims contains 1 grain of the substance.

In the Pharmacopœia of 1885 an attempt was made to get out of the difficulty by introducing the word grain-measure, the grain-measure being the volume of a grain of distilled water, but save for the purpose of volumetric analysis the grain-measure does not exist, and in the present Pharmacopœia all allusion to it is omitted. Throughout the volume, when the strength of a solution has to be indicated by the amount contained in 100 grains of water, the amount contained in 110 minims is given. Liquor arsenicalis, for example, is a 1 per cent solution; that is, a solution of which 100 grains contains 1 grain of arsenious acid. But whilst when describing its strength according to the metric system, it is said that 100 cubic centimetres contain 1 gramme, if the imperial system be used, we have to say that 110 minims contain one grain. The exact statement of the percentage strength, when minims and grains are used, therefore becomes practically impossible. It must be borne in mind, however, that the metric system is not absolutely free from a similar difficulty. A litre of water is the volume of 1,000 grammes of water at 4° C., and a millilitre is the volume of a gramme of water at the same temperature. In the metric system, however, the measure of capacity usually employed is the cubic centimetre, which is commonly considered as the volume of a gramme of water or a millilitre, but as a fact a cubic centimetre is only equivalent to 99,984 millilitres, and 1000·16 cubic centimetres are equivalent to a litre. Another difficulty in the metric system arises from the fact that in England the measures are graduated at 60° F., not at 39·2° F (4° C.). The litre commonly used in England, therefore, does not absolutely correspond to the standard litre, which is graduated at the lower temperature. But the difference between the cubic centimetre and the millimetre is so slight, and the influence of temperature so unimportant, that throughout the Pharmacopœia 1,000 cubic centimetres are regarded as equivalent to a litre at whatever temperature graduation has taken place.

It has been suggested that the doses should be given in the metric as well as in the ordinary English weights and measures. But, apart from the fact that it would be very difficult to give useful metric equivalents to the doses as now stated, the fact that in the case of liquids the

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teaspoonful and the tablespoonful must long continue to be the patient's measure for taking medicine makes it undesirable to introduce at present the metric dose. The relation of the metric to the household measure would have to be borne in mind, and practitioners have quite enough to remember without adding to the burden.

In the recent revision of the Pharmacopœia great changes have been made; but, doubtless, still further changes will in time be necessary. Amongst these the introduction of metric dosage may at some future time find place.

CHRONICLE.

Medicine.

UNDER THE CHARGE OF JULIUS DRESCHFELD, M.D., F.R.C.P.

TURNEY. "Polyneuritis in relation to gestation and the puerperium."—*St. Thomas's Hospital Reports*, Vol. XXV.

THE author begins by pointing out that the rare condition known as "puerperal neuritis" may occur during pregnancy as well as after labour. He considers it to be a multiple or toxæmic neuritis, although, under certain circumstances, its full characteristics of multiplicity and symmetry may not be displayed. In discussing this condition it is necessary to exclude "local lesions which owe their origin to the mechanical conditions of childbed, or to the inflammatory complications which may succeed it." Indeed the term "obstetric neuritis" should be confined to inflammations of nerves initiated during labour. Puerperal neuritis must also be carefully distinguished from polyneuritis caused by alcohol, lead, the toxins of diphtheria or those of ordinary septicæmia, occurring during pregnancy or the puerperium as "separable accidents." Any of these can, of course, occur in the male subject, and obviously must be kept distinct from the true polyneuritis of gestation, supposing such to exist.

Turney recognises three clinical types of this disease: (1) Generalised neuritis; (2) localised polyneuritis—(*a*) upper limbs, (*b*) lower limbs; (3) neuritis affecting a single nerve with no ascertainable local cause.

In 13 cases of the generalised type, symptoms appeared at times varying from the fourth month of pregnancy to a fortnight after delivery (six during pregnancy, seven after labour). Pain was the earliest

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symptom, and the lower limbs were first affected as a rule. Loss of muscular power followed, and complete paralysis often supervened, with rapid wasting, loss of reflexes and reaction of degeneration. Spontaneous pain was replaced after a few days by tenderness of nerves, muscles, and skin. Sensation was, as a rule, much less affected than motor function. The vagus, spinal accessory, and cranial nerves were affected in some of the cases; mental symptoms were frequent, and varied from mere emotionalism to acute mania. Recovery was complete in a few months in some cases, but in others it was delayed for one and two years.

Of the localised type the author details three new cases, and tabulates 20 which he has collected. The upper limbs were affected much more frequently than the lower. The cases in which the legs alone were affected resembled in other respects the generalised cases much more closely than did those in which the arms alone were involved. Mental symptoms, for example, occurred in the lower-limb group, but not in the upper-limb group.

The cases in which a single nerve was affected were less clearly "puerperal" in origin than the above.

In discussing the ætiology of the condition, the author points out that Möbius, who first described it in 1887, put forward the auto-intoxication theory. This has now, he says, been raised to the level of fact. It has been shown "that the toxicity of the urine is largely increased during pregnancy, and that in certain cases the toxicity of both urine and serum may be augmented, this proving an absolute increased formation of toxines." We are, however, still ignorant of the nature of these toxines. Dr. Turney next explains as auto-intoxications other diseases of pregnancy, such as eclampsia, vomiting, acute yellow atrophy of the liver and various psychoses, including acute mania and melancholia. A case of recurring amblyopia, due to pregnancy, is next recorded, and explained as a retro-bulbar neuritis of auto-toxic origin. Myelitis of pregnancy is referred to, and a case of pure anterior poliomyelitis following labour is recorded. "This observation," says the author, "rounds off the possibilities of auto-intoxication with regard to the nervous system in as complete a manner as can be desired. The cortical centres in the brain, the motor nuclei in the pons, the corresponding nuclei in the cord, the purely sensory tract of the optic nerves, the nerves of the medulla, and finally those of the extremities, all in turn suffer from the effects of the poison." The alimentary canal is thought during pregnancy to be the chief birthplace of the toxines concerned, which, overcoming the neutralising powers of the liver, pass thence into the circulation. During the puerperium, the rapid involution of the uterus is thought to throw into the circulation quantities of effete matter. The neurotic diathesis is regarded as a predisposing

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cause in those cases in which the auto-toxines of pregnancy produce nervous disease.

The diagnosis depends upon the history, as the symptoms are indistinguishable from those of alcoholic polyneuritis. The prognosis is good, as regards life, only one case in 36 having proved fatal. Recovery is complete though slow in most cases. In very few cases has a tendency to recurrence in successive confinements been noted. Primiparæ are not affected with undue frequency. Prophylaxis consists in aiding the emunctories. Treatment during pregnancy is practically confined to terminating pregnancy. In the puerperium the treatment is symptomatic.

The interesting paper by Dr. Reynolds on the above subject is so accessible in the *British Medical Journal* of Oct. 16th, 1897, that it need not be abstracted. *W. E. Fothergill.*

KOPLIK. "A new diagnostic sign of measles."—*Medical Record*, April 9, 1898.

THIS new pathognomonic sign of measles appears on the mucous membrane lining the cheeks and lips. During the first twenty-four or forty-eight hours after the invasion of measles, catarrhal symptoms, with slight pyrexia, are present, but as yet no indication of any eruption on the skin. If at this period the mouth be examined in a strong light, bright-red irregular spots are to be seen on the mucous membrane lining the cheeks and lips. The phenomenon up to this point has been described by many writers, but Koplik points out that in the centre of each of the small bright-red spots a most minute bluish-white speck is to be found. This bluish-white speck is absolutely diagnostic of beginning measles, and is present fully twenty-four, or forty-eight, or even seventy-two hours before the appearance of the rash. When this occurs, the eruption on the buccal mucous membrane undergoes a characteristic change, the discrete spots coalesce, and we have instead an intense general redness, dusted over with myriads of bluish-white specks. The eruptions of the skin and the mouth fade together, the latter disappearing first. The value of this new sign of measles in aborting epidemics of the disease in children's hospitals is very considerable. Isolation can by its means be practised at a much earlier period in the disease. Koplik has examined the buccal mucous membranes in the large number of diseases which may simulate measles, including cases of rötheln, erythema multiforme, drug eruptions, scarlet fever, and commencing influenza. In no single instance was the sign present. Aphthous stomatitis might be mistaken for this sign, but is distinguished by the patches being yellow and much larger, and, in addition, they show ulceration. *N. Fox Edwards.*

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Smith (Walter G.). "Cystinuria."—*Practitioner*, May, 1898.

In this article the writer gives a concise review of our knowledge respecting cystinuria, and briefly records two cases.

The first was that of a boy, aged 8 years. The general health was excellent. The sediment from the urine was slate-coloured. Cystin crystals were found on microscopical examination of the urine. But the cystin deposit was transitory.

The second case was that of a middle-aged lady, who suffered from rheumatic pain in the knees. A white sediment was found in the urine, which was composed almost entirely of cystin. The cystin deposit had disappeared six days later.

The author thinks that the following conclusions "embody the chief points which have been made out within recent times in regard to cystinuria":—

(1) Cystin is a product of proteid metabolism, probably the result of a synthetic process.

(2) It has no relation to uric acid, or to gout or rheumatism.

(3) It is in no way connected with taurin, which is a sulphonic acid, $C_2H_4(NH_2)SO_3H$.

(4 Its probable forerunner in the body is cysteïn, which is a strong base soluble in water,

$$2\,C_3\,H_7\,N\,SO_2 + O = (C_3\,H_6\,N\,SO_2)_2 + H_2\,O.$$

(5) Traces of cysteïn, or of a body closely related to it, occur normally in urine.

(6) The sulphur of the cysteïn is, as a rule, oxidised to SO_4 (ordinary and ethereal).

(7) Under certain unknown conditions, cysteïn escapes full oxidation, and is partly excreted as cystin.

(8) Cystinuria has been found to be associated with diaminuria by several observers.

(9) Cystinuria may be intermittent or occasional.

(10) Cystinuria and diaminuria are possibly due to a common cause, viz., peculiar intestinal micro-organisms.

(11) Therapeutically, the indication is to disinfect the intestine.

Bradford (J. R.). "On a form of Bright's disease occurring in young women."—*Practitioner*, April, 1898.

The author points out that three well-defined types of chronic Bright's disease are usually recognised:—(1) The large white kidney; (2) the small or contracted white kidney; (3) the granular kidney. But he records six cases of chronic Bright's disease in which the kidneys "did not fall into the above classification. They were small, usually averaging

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some 3oz. a piece, occasionally less." . . . "The capsule was considerably thickened, but stripped off readily without tearing the kidney substance, and offering in this respect a marked contrast to what is seen in the granular kidney. The surface of the kidney, however, was extremely irregular, the granulations being approximately $\frac{1}{16}$in. in diameter. The cortex was greatly diminished, and the distinction between cortex and medulla was frequently lost. The surface of the kidney and the section of the cortex both presented a mottled appearance; the medulla was congested. The state of the renal artery varied. In some cases the coats were appreciably thickened; in others the vessels were not greatly diseased." Dr. Bradford points out how the kidneys differed from the contracted white kidney. In the latter affection the kidney surface is not so irregular, and the cortex, although greatly diminished in thickness, is usually of a more uniform pale yellowish colour. The following are the three characteristic features, apart from the great diminution in renal substance, in the form of Bright's disease in young women, to which Dr. Bradford draws attention:—

(1) Notwithstanding the thickening of the capsule, this is not unduly adherent to the kidney surface.

(2) The external surface of the kidney is markedly granular.

(3) The cortex presents a very mottled appearance.

The clinical history of 6 cases is recorded, along with the results of post-mortem examination. The ages of these six patients were 30, 21, 24, 24, 23, and 19 respectively. The symptoms were similar in all of the cases. In all, the symptoms for which the patient sought treatment were at first comparatively trivial, and in all cases death ensued very rapidly from various forms of acute uræmia. In all cases but one albuminuric retinitis was present. In all cases dropsy was absent during the last illness, and in only one of the 6 was there any history of dropsy. In none of the cases was there a history of scarlet fever, and there is no reason to suppose that the kidney lesion arose from an unrecognised scarlatinal nephritis. "In 5 out of the 6 cases the onset was so gradual that the patient could not date it." Dr. Bradford thinks the characters of the urine are important. The amount was normal, or considerably increased, and a high percentage of albumen was present. The specific gravity was low. "The fact that the abundant dilute urine contained a large quantity of albumen separates these cases from granular kidney, inasmuch as their history lends no support to the view that they were cases of renal cirrhosis complicated by an intercurrent attack of acute nephritis; and further, as mentioned at the outset, the post-mortem characteristics of the kidney were quite different from those with which one is familiar in the granular kidney."

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Clinically these cases were characterised by the absence of dropsy, and by the sudden termination in acute uræmia; also inflammatory complications were not prominent symptoms.

The author thinks, both from the post-mortem conditions of the kidneys and from the characters of the urine excreted during life, that the cases form a distinct variety of Bright's disease, which may be recognised and separated both from granular kidney and the large and small white kidney; "also the clinical course of the disease suggests that it is a chronic and insidious malady, rather than the sequel of an acute nephritis that was not recognised."

Five out of the six cases had well-marked albuminuric retinitis.

R. T. Williamson.

FRAENKEL (A.). "On the significance of mixed infection in tuberculosis."—*Berlin. klin. Wochenschr.*, No. 16, 1898.

WE have to distinguish (1) between a primary tubercular infection, to which a secondary infection, with other micro-organisms, has been superadded, and (2) between other parasitic diseases which have prepared a suitable soil for the secondary growth of tubercle bacilli. The former is more frequent than the latter. Investigation has proved that only a moderate number of micro-organisms usually occur together with tubercle bacilli, and of principal practical interest are only the co-infections with strepto- and pneumococci. The presence of staphylococci in the blood of phthisical patients, as described by some authors, is, according to Fraenkel, not proved.

Investigation on these points have to be made by careful and methodical microscopical and bacteriological examinations of the secretions (sputa, etc.); secondly, of the blood; and, thirdly, of the organs, obtained post mortem.

According to Koch and his school the hectic fever of tubercular patients is due to co-infection with streptococci, for, firstly, these organisms are frequently found in the secretion and in the walls of cavities, and, secondly, an infection with streptococci produces in non-tubercular subjects an analogous temperature-curve. Though in most instances the fever, etc., are due not so much to the presence of streptococci themselves in the blood as to some of their products, in some cases observed by Fraenkel streptococci were very abundant in the blood Such cases are distinguished by the formation of multiple pneumonic foci, purulent effusions in pleura and pericard, and other metastatic phenomena.

On the other hand, Spengler and Schabad have observed cases of ulcerative phthisis with febrile temperature, where the blood was free

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from streptococci, and the rise of temperature due, therefore, to the tubercle bacillus.

Empyemata of phthisical patients are in a large number of cases—even when complicated with pneumothorax—free from strepto- and staphylococci.

Tubercular patients occasionally get genuine fibrinous pneumonia, in no way differing from healthy individuals, but taking the numbers of the Berlin Urban Hospital, tubercular patients are less frequently attacked than healthy individuals. Out of 750 cases of pneumonia observed among a total of 21,430 patients only 15 occurred in phthisical individuals, whilst the total number of phthisical patients amounted to 3,250; according to this pneumonia would attack the non-tubercular eight times as frequently as the tubercular.

Well to be distinguished from this is the acute cheesy pneumonia or pneumonic form of acute pulmonal tuberculosis. Characteristic for this are the sudden occurrence of extensive dulness in patients previously tubercular, together with loud bronchial breathing and subcrepitant râles. The sputa may be rusty and similar to ordinary pneumonic sputa, but they have more frequently a greenish tinge. The illness at first is in many of its symptoms similar to genuine lobar pneumonia, but whilst in this the resolution takes place in the course of a week or two, in the other the dulness, etc., persist, and the patient usually dies quickly.

The anatomical process offers a distinct macroscopic and microscopic picture. The infiltrated lung-tissue presents on section a perfectly smooth, and not, as in genuine pneumonia, a granular surface, the infiltration being of a translucent and gelatinous character. Here and there small opaque grey points are visible, foci of commencing caseation. Often even the naked eye appearance shows the confluent lobular, and only apparently lobar character of the process. Microscopically, this becomes more evident, and it is seen that the alveoli at the margin of the infiltrated tissue are filled with serous exudation, and a few large mononucleated cells; towards the centre the alveoli contain more and more of these cells, and are finally gorged up with them, intra-alveolar tubercles being thus formed.

In this form of pneumonia, according to Troje and Fraenkel's observations, other micro-organisms could but rarely be found, and the pneumonia appears solely due to the action of tubercle-bacilli and their products.

Where in cases of longer duration an immigration of other micro-organisms takes place, there the cellular contents of the alveoli assume a different appearance, polynuclear cells prevailing.

Cases where secondary to lobar pneumonia tuberculosis develops are,

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according to Fraenkel and Weigert, generally due to an irruption of old tubercular deposits from other parts of the body—mostly from the bronchial glands.

ZINN. "Persistency of the ductus arteriosus Botalli."—*Berlin. klin. Woch.*, No. 20, 1898.

A PATIENT of Gerhardt's Clinic presented the following symptoms, which are described as characteristic of the above condition:—(1) Dilatation of the heart-dulness to the right; (2) prolongation of the heart-dulness in its upper part in the form of a narrow quadrangle along the left sternal margin; (3) a loud systolic bruit prolonged into the commencement of the diastole, most distinctly to be heard over the area of the pulmonal valve; (4) the bruit to be heard over the carotids and subclavian arteries; (5) in contradistinction to pulmonal stenosis, the absence of cyanosis.

In Zinn's case the diagnosis was confirmed by the Roentgen-ray picture. On the fluorescent screen a shadow could be seen reaching over to the right parasternal line and corresponding to the dilated right ventricle, and a lighter shadow behind the upper part of the sternum, reaching two to three centimetres to the left of the sternum. This shadow showed a distinct pulsation in an oblique direction from the right below to the left above, corresponding to a dilated pulmonal artery. *S. Moritz.*

Surgery.

UNDER THE CHARGE OF THOMAS JONES, M.B., B.S., F.R.C.S.

VAUGHAN (G. T.). "Excision of the right clavicle for sarcoma."—*Medical News*, January 8, 1898.

CASES of complete excision of the clavicle are still sufficiently rare to justify publication. The author places on record a case in which he performed this operation with marked success. The patient was a man, aged 28. Seven months before he came under observation he had noticed pain in the region of the right clavicle, followed shortly afterwards by the appearance of a tumour. The growth involved the inner two-thirds of the bone. The operation was performed on the 22nd of October, 1895, under ether anæsthesia. An incision was made along the whole length of the clavicle; the acromial end of the bone was disjointed first, the tumour was then gradually freed, and lastly, the sterno-clavicular

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joint was disarticulated. Twenty ligatures were applied to check hæmorrhage. The detached portions of the trapezius and sterno-mastoid were sutured to the corresponding parts of the deltoid and pectoralis major. The patient made an uninterrupted recovery. Twelve months later he was in good health, and it is stated that "during the interval he had been performing his accustomed work as fireman on a steamboat, and stated that he felt no inconvenience from the loss of his clavicle, his arm being free from pain, and as strong as ever." Microscopic examination of the growth showed it to be a mixed-celled sarcoma.

Ashurst, in 1893, was able to collect only 36 cases of complete excision of the clavicle at one sitting. Of these cases, 7 died. The same writer collected 76 cases of partial excision or complete excision *à deux temps*, with a mortality of 14 per cent.

FISHER (EDWARD D.). "When is surgical interference justifiable in cerebral disease?"—*New York Medical Journal*, April 6, 1898.

IN consequence of want of success, cerebral operations are at present somewhat discredited. The author states that no operation should be undertaken in general paralysis of the insane. He gives the following as some of the indications for operation:—

(1) Fracture of the skull, causing compression, with resulting paralysis, epileptiform seizures, or coma.

(2) Meningeal hæmorrhages—traumatic, or occurring in pachymeningitis hæmorrhagica.

(3) Tumours of the brain, when situated in the cortex, or even in the cerebellum, but not when deeply seated or at the base of the brain. In certain cases, when the tumour itself is irremovable, the removal of a large area of the skull gives marked relief to the symptoms.

(4) Localised epileptic seizures of the Jacksonian type.

(5) Cerebral abscess, especially in the forms due to otitis media.

The author recommends that in these operations a large area of the skull-cap be removed. He concludes his paper by a record of three cases

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HORWITZ (ORVILLE). "Ulcer of the rectum—Stricture of the rectum, due to syphilis."—*Philadelphia Polyclinic*, April 9, 1898.

ULCER of the rectum is not an uncommon disease, but is very often overlooked. It occurs most frequently in females. The principal causes are syphilis, obstinate constipation, chronic dysentery, injuries to the vagina and uterus during parturition, and occasionally operations upon the rectum. Details of two cases are given, both of which were of syphilitic origin. Most of the patients suffering from this disease

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will give a history of chronic dysentery, of tubercular affections, or of syphilis, which will serve as a guide to diagnosis. The author has been struck by the apparent connection between hypertrophy of the external genital organs in women, and syphilitic ulceration of the rectum, accompanied by stricture.

With regard to treatment, the diet should be to a large extent liquid, and should consist of concentrated nourishment, taken in small quantities at short intervals. Potassium iodide has not given much relief, except in cases of commencing stricture and in cases accompanied by gummatous ulceration of the submucous tissue. Locally, the best results have been obtained by the lavage of the lower bowel with a warm solution of silver nitrate (1 in 5,000). Touching the ulcer very gently with solid nitrate of silver may give benefit. Any tendency to contraction should be counteracted by the use of rectal bougies.

Stricture is generally situated in the lowermost three inches of the bowel (16 out of 18 cases). In these cases gradual dilatation is the safest and most satisfactory method of treatment. In annular strictures, situated near the sphincter, much time will be saved by resorting to linear proctotomy. In tubular strictures, associated with abscesses and sinuses, and with marked obstruction, lumbar colotomy should be performed, and should be followed at a later stage, if the condition of the patient permits, by resection of the rectum by Kraske's method.

Tubby (A. H.). "Some unusual cases of hernia."—*Medical Press and Circular*, September 22, 1897.

In this paper four interesting examples of rare forms of hernia are recorded.

Case 1 was a strangulated congenital inguinal hernia on the left side, the sac of which contained the cæcum, the appendix, a portion of the ascending colon, and some small intestine. The patient was a boy, aged 3, who had suffered from hernia from birth. Symptoms of strangulation had been present for twenty-four hours before operation. The patient made a good recovery. This case is especially interesting because the hernia of the cæcum was on the left side.

Case 2 was a strangulated inguinal hernia, with contents similar to Case 1, but was on the right side. The patient was a boy, aged 12 months, and recovered after operation.

Case 3 was a strangulated right inguinal hernia, with hour-glass contraction of the sac and gangrenous omentum. The patient was a man, aged 40. Herniotomy was performed, and was followed by recovery.

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Case 4 was a left interstitial inguinal hernia of both ovaries and Fallopian tubes. The patient was a girl, aged 4 months. A swelling had first been noticed in the groin, three weeks before admission to hospital. At the time of operation it was found that the hernial sac was situated between the internal oblique and transversalis muscles. The left ovary and Fallopian tube were removed, the right ovary and tube being reduced into the abdominal cavity. Death took place twenty-seven days after the operation from cellulitis of the abdominal wall.

J. E. Platt.

Midwifery and Diseases of Women.

UNDER THE CHARGE OF W. J. SINCLAIR, M.A., M.D.

CROOM (T. HALLIDAY). "Senile uterine catarrh."—*Edinburgh Medical Journal*, April, 1898.

IT is well known that, in cases of endometritis arising after the menopause great difficulty is often met with in the differential diagnosis from malignant disease. In this paper Dr. Croom records several illustrative cases. He recognises clinically three types of senile uterine catarrh :—

(1) Those associated with fœtid discharge and no hæmorrhage.

(2) Those characterised by leucorrhœa and slight hæmorrhage.

(3) Those in which hæmorrhage is the main symptom.

The symptoms are extremely like those of malignant disease. The patient may become sallow and cachectic, the result in reality of slow sepsis. Pain in the back is often present, associated with watery, purulent, or bloody discharge.

Per vaginam the uterus may be slightly enlarged. The introduction of the sound is very painful, and a curetting shows infiltration of the mucosa with leucocytes and granular degeneration.

The writer mentions the following points as worthy of consideration in diagnosing this condition from cancer :—

(1) In primary fundal cancer periodic and severe pain is an early symptom. In uterine catarrh it is slight and often colicky.

(2) In cancer fœtid discharge is unusual, in the early stages at least. In catarrh it is an early and prominent symptom.

(3) Locally, in cancer the uterus is distinctly enlarged, heavy, and tender, and dilatation with exploration reveals the presence of a growth which is, of course, absent in catarrh.

Dr. Croom does not consider that senile catarrh tends to terminate in malignant disease, and asserts that these cases can be readily cured, and hence the procedure of hysterectomy avoided, if an accurate diagnosis be made.

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The best treatment is no doubt curetting and drainage, but the application of dressed probes, soaked in carbolic acid, may effect a cure. Internally, arsenic and Chian turpentine are recommended.

ROSENWASSER. "Post-climacteric troubles simulating advanced cancer of the uterus."—*Amer. Jour. of Obstetrics*, October, 1897.

IRREGULAR hæmorrhage and offensive discharge, so characteristic of cancer, may be simulated in old women by various other conditions, all of which should be carefully excluded by local examination before making a diagnosis. The following list of conditions simulating advanced cancer is given:—Senile vaginitis, foreign bodies in the vagina, gangrenous fibroids, senile endometritis, and pyometra. Pyometra is especially liable to be confused with carcinoma of the body, and the author gives details of six cases collected from the literature in which a provisional diagnosis of corporeal cancer had been made. In the discussion which followed the introduction of this subject Dr. Hall related a case of supposed cancer after the menopause, in which the uterus was distended to the size of a child's head, and contained a pint of pus.

GALLAVARDIN. "On two cases of pelvic abscess opening into the uterus." *Annales de Gynæcologie*, March, 1898.

IN this paper full notes are given of the two cases in which this very rare termination of a pelvic abscess occurred, and a brief resumé of the literature of the subject is added.

Case 1.—Primipara; natural labour; symptoms of infection arose on the second day, with signs of left pleurisy. On the fourth day a large hard swelling was felt in the left iliac and lumbar region, over which the skin became rapidly reddened.

On the sixth day the patient was extremely ill, and pus escaped from the vagina. This was found on examination to come from an opening inside the cervix uteri, and into this a drainage tube was passed. The patient, however, gradually became worse and died on the tenth day with signs of general peritonitis and septicæmia.

Post mortem.—The left broad ligament was distended to form a large irregular cavity containing phlegmonous material. This had opened into the cervix uteri, just above the external os, by a track which admitted the finger. The other organs were normal, except for slight pleurisy at the base of each lung.

This was evidently one of the cases of acute phlegmonous cellulitis of the broad ligament which are nearly always fatal.

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Case 2.—Primipara; natural labour at term; signs of infection arose on the third day, and since then patient had remained in bed. She was first seen two weeks after delivery. The uterus was pushed to the left by a large mass in the right broad ligament, bulging into the posterior cul-de-sac. She had profuse discharge of pus from the vagina, but no opening could be discovered. By the speculum pus was seen to come through the cervix. The finger introduced passed into a cavity in the base of the broad ligament through the uterine wall. As the patient was becoming worse the posterior cul-de-sac was incised and the mass in the right side of the pelvis punctured. The collection of pus was evacuated. The patient, however, died three days later.

Post mortem.—Extensive pelvic peritonitis was found. The right broad ligament had been the seat of a large abscess, and the opening of this into the cervix uteri admitted a finger. The ovary on this side contained pus. In the wall of the uterus also, multiple small abscesses were found.

The patient died six weeks after delivery.

Dr. Gallavardin discusses the various points in relation to this affection, which may be summarised as follows: Of 9 recorded cases, all, with one exception, were puerperal in origin.

The situation of the abscess appears to have been, in the first place, in the cellular tissue of the broad ligament. In no case did a suppurating tube or ovary burst into the uterus. The abscess has usually been large, and often extended into the iliac fossa. In some instances it has been associated with suppurative oophoro-salpingitis. The period at which the abscess opens into the uterus has been very variable. Commonly it is after one or two months; in one case it was six months; and, again, it may be as early as the seventh day after delivery. The opening is always in the lateral wall of the cervix, a little distance above the external os. Its dimensions vary from one admitting a probe only to a large track, allowing the finger to pass along it. In a few cases there has been a second communication of the abscess cavity with the intestine or bladder.

The *symptoms* are those of a pelvic collection of pus, with discharge through the vagina. No opening is discovered in the vagina, but with a speculum pus may be seen to issue from the cervix. It is, however, necessary to explore the cervical canal with the finger, and feel the opening of the fistula. If the opening is very small, the diagnosis from a salpingitic discharge must be made by the physical characters of the mass in the pelvis.

The *prognosis* is very grave. So far as is known, no cases have recovered. This is not owing entirely to the presence of a uterine open-

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ing, but to the insufficient drainage of the cavity, and to the frequent association of suppurating tubes or ovaries.

The *treatment* is simple. The pelvic collection must be opened and drained either through the abdominal wall or the posterior cul-de-sac, according to the special circumstances of the case.

TURENNE. "Abscess of uterus and broad ligament."—*La Gynæcologie*, April, 1898.

THE patient, a multipara, after a natural labour, had the signs and symptoms of pelvic cellulitis of the left broad ligament, associated with a fœtid discharge from the uterus.

Dr. Turenne saw her six weeks after delivery for the first time. She was emaciated and feverish. A tumour, the size of an ostrich egg, was found in the left broad ligament bulging into the antero-lateral fornix, and pushing the fundus uteri to the right side. The swelling was painful, slightly mobile, and clearly fluctuant. The body of the uterus was soft and bulky, but freely movable. A diagnosis of abscess of the broad ligament was made and immediate operation advised.

Whilst dilating the cervix uteri with Hegar's instruments, the uterine wall was found to be very soft and friable, and an apparent perforation occurred. The anterior cul-de-sac was then opened, and the swelling exposed, bulging from the front of the left broad ligament. This was punctured, a large quantity of thick yellow pus being evacuated. As, however, it seemed probable that the uterus had been perforated it was considered advisable to proceed to total extirpation. During this part of the operation the uterine wall was found to contain one large abscess and numerous smaller ones extending up to the fundus. These collections were in the muscular coat, and limited to the left half of the uterus. The appendages on both sides were absolutely healthy. The patient recovered satisfactorily, leaving the hospital a month later.

The rarity of abscess of the uterus is admitted by all. It is, however, probable that in some cases of severe puerperal infection abscess formation may be not very uncommon. Thus, multiple parenchymatous abscesses have been found in uteri extirpated for acute puerperal infection, but in many cases this disease terminates fatally before there is time for the definite development of pus in the uterine wall. In this case it would seem there was a local infection of the uterus propagated through its wall by the lymphatics, and leading also to the abscess in the broad ligament. The reason for dilating the cervix before opening the broad ligament abscess is not clearly given in the paper. The perforation, however, appears to have been a fortunate thing for the patient, inasmuch as otherwise the condition of the uterus would not have been discovered.

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Doléris. "Puerperal infection after delivery at full term."—*L'Obstétrique*, January, 1898.

During the last three years 21 cases of puerperal infection have been observed and treated in the Maternity Hospital of La Pitié. The mortality has been nil, and in every case a definite cure of the disease was obtained. These statistics, including brief notes of all the cases, are published with the object of showing the value of early intra-uterine treatment.

In every instance the uterine cavity was explored, and curetted as soon as signs of infection were clearly manifest, viz., at periods ranging from 22 hours to 6 days after delivery.

Doléris insists on the perfect safety of this procedure; in no cases were any bad symptoms observed to follow. Chloroform was rarely given, the pain being, as a rule, trivial.

The cervix was expanded with graduated metal dilators, combined with frequent investigation by the finger.

A large curved curette with a sharp edge was used to the whole interior of the uterus, its movements being controlled by a hand on the abdomen holding the fundus uteri firmly.

The cavity was then rubbed over with an antiseptic solution, a large intra-uterine douche given, and iodoform gauze introduced as a drain.

Further, if the symptoms do not immediately subside, prolonged intra-uterine treatment by irrigation and tampons is carried out, with topical applications to lacerations of the cervix and "rational" treatment of parametric thickening or oophoro-salpingitis.

Perfect recovery appears to have been obtained in every case by the end of six to eight weeks. *A. W. W. Lea.*

Pharmacology and Therapeutics.

Under the Charge of D. J. LEECH, M.D., D.Sc., F.R.C.P.

Chemical Constitution and Physiological Action.

Cash (J. T.) and Dunstan (W. R.). "The pharmacology of aconitine, diacetyl aconitine, benzaconine, and aconine, considered in relation to their chemical constitution."—*Proceedings of the Royal Society*, Vol. LXII., p. 338 (abstract).

Moore (B.) and Row (R.). "A comparison of the physiological actions and chemical constitution of piperidine, coniine, and nicotine."—*Journal of Physiology*, Vol. XXII., p. 273.

The relation between chemical constitution and physiological action is one of the easiest and at the same time one of the most difficult in phar-

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macology. The determination of the toxic effects of a series of substances offers no difficulty to any practical physiologist, but the deductions to be drawn from these effects requires all the acumen of the experienced investigator. It is not sufficient to remove or introduce known radicles into a compound and note the physiological effect of the altered substances. The question of solubility, stability, metabolic changes within the organism, etc., must be taken into account. Some compounds, for example, are methylated (tellurous acid, etc.); others are demethylated (caffeine, etc.). But the question is even a wider one, for pharmacology has come to be the science dealing with the inter-action of chemical substances with living matter; and for a satisfactory explanation of the relation between chemical constitution and physiological action, it will be necessary to know the constitution of living protoplasm, or at least something more of the causal factor of life. Already various theories have been proposed, but none of them are satisfactory. Perhaps the most ingenious, at least from our present point of view, is that of Loew (*Ein naturlich. Syst. d. Giftwirk.*, München, 1893, p. 39). He believes that living protoplasm, as distinct from dead, is intimately connected with the presence of an aldehyde and amide radicle, and consequently that substances which in a dilute state react with these are poisonous. His results certainly are based upon experiments with the lower forms of life, but this mode of experimentation is more likely to give us a general explanation of the action of poisons than any other. At the present time, however, in considering the relation between chemical constitution and physiological action we ignore the fairly constant vital factor x, and deal only with changes in the molecules of chemical bodies.

At first it was thought that bodies with allied chemical structure would present allied physiological effects, but this was soon found not to be the case. Minute changes in chemical composition induced profound alterations in physiological action. In some complex bodies the effect seemed to be dependent on, but not necessarily due to, the presence of a hydroxyl (OH) group; in others the relative positions of the radicles determined the action. Stereo-chemical isomerism may even play a part; and in a recent communication Fischer suggests an explanation of enzymic action which may subsequently be applied to pharmacological work. Fischer prepared α- and β-methyl-glucosides, and subjected them to the action of invertase. Part of the α-compound was hydrolised; the β- remained unchanged. He suggests the explanation that the fermentative active principle possesses a similar or complementary configuration to the sugar on which it acts, and "the configuration of the two, fitting as it were into each other, the disruption of the sugar molecule by the action or possible vibration of the fermentative principle becomes conceivable." (Green, *Nature*, April 21, 1898.)

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In the simpler organic compounds, however, homologous chemical series present similar physiological effects; and it is mainly in the more complex bodies that alterations in physiological action result from slight changes in chemical constitution. The *raison d'être* of the latter we do not know; it must be connected with certain metabolic changes occurring within the body, but what these are have not, in many cases, been determined. For the present the facts must simply accumulate.

Cash and Dunstan's work consists of a comparison of the physiological effects of aconitine and some of its derivatives. The chemical part of the work is mainly a summary of researches which have been published by Dunstan and his pupils in the *Pharmaceutical Journal* and the *Journal of the Chemical Society*. For the purposes of this paper, aconitine is regarded as acetyl-benzaconine; but it cannot be obtained by acetylising benzaconine. This substance does not yield a monacetyl derivative, and higher acetylised products (*e.g.*, triacetyl-benzaconine) are not identical, but only isomeric, with correspondingly acetylised aconitine (*i.e.*, diacetyl-benzaconine). Of the constitution of aconine nothing is known.

The substances investigated physiologically were—aconine, $C_{24}H_{39}NO_{10}$; benzaconine, $C_{24}H_{38}$ (C_6H_5CO) NO_{10}; acetyl-benzaconine (aconitine), $C_{24}H_{37}$ (CH_3CO) (C_6H_5CO) NO_{10}; and diacetyl-aconitine, $C_{24}H_{35}$ $(CH_3CO)_2$ (C_6H_5CO) NO_{10}. In all cases the hydrobromide of the alkaloid was used. Their effect was studied on (1) the blood-pressure, pulse, and respiration of anæsthetised cats; (2) the temperature, respiration, etc., of rabbits and guinea-pigs; (3) the circulation, reflexes, cutaneous sensibility, etc., of frogs; and (4) their lethal doses on various animals. As an example of the last, the effect on cats will suffice. In these animals the toxic doses per kilo body-weight are:—Aconitine, 0·000134g.; diacetyl aconitine, 0·004—0·00515g.; benzaconine, 0·0245g.; aconine, 0·166—0·4g. Introduced into the circulation, "aconitine at first stimulates medullary centres, slowing the heart; acceleration follows, auricles and ventricles taking up an irregular and (at one stage of toxic action) independent rhythm. Imperfect systole (especially in the ventricles) develops. Irritability of ventricular wall is much increased. Extensive variations of blood-pressure accompany the preceding phenomena. After great ventricular acceleration with very imperfect systole, delirium of the ventricles supervenes. The vagus (stimulated) continues to restrain speed of contraction (especially acting upon the auricle) and may favour closer sequence of ventricular upon auricular systole, so as to cause a rise in blood-pressure. For the same reason, during a stage of sequence, it may cause the usual effect (fall of pressure). In slow poisoning the cardiac vagus, on stimulation, ceases to produce any effect." Diacetyl aconitine produces similar though less

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marked effects. Benzaconine causes depression of the cardiac motor apparatus, a greater fall of blood-pressure, and a blocking of auricular impulses to the ventricle producing a rhythm which is largely reversed to that of aconitine. Digitalin is said to be "the most effective antagonist towards benzaconine." Aconine, compared with the three compounds considered, is relatively harmless to the heart; it even shows an antagonistic effect towards aconitine and diacetyl aconitine.

As regards the respiration, "aconitine at first stimulates the respiratory centre and the sensory vagal fibres in the lung. Depression rapidly follows, death in mammals being due to central respiratory failure." Diacetyl-aconitine produces less initial stimulation, and benzaconine depresses both the respiratory centre and pulmonary vagus from the first. Aconine slows the respiration from its action on the centre, and produces a curare-like action on the motor nerve endings in the respiratory muscles.

The cerebro-spinal centres and sensory nerves seem to be stimulated by aconitine at first, and afterwards depressed. After large doses loss of consciousness sometimes occurs. Diacetyl-aconitine produces a similar, though less marked effect. The motor nerve-terminations also seem to be depressed by this drug. Benzaconine depresses the cerebro-spinal centres, but it exerts no effect on sensory nerves, except in deep poisoning. Aconine has comparatively little effect; its chief action is a curare-like effect on motor nerve-endings.

The effect on the temperature runs almost parallel with their effect on the heart and respiration; aconitine is the most active (half-lethal dose causes a fall of about 2° C.); aconine the least.

It would therefore appear that the addition of two acetyl groups into an aconitine molecule merely exerts a weakening effect, but that the withdrawal of the acetyl radicle forming part of the aconitine molecule results in a complete change in physiological action. Similarly the loss of a benzoyl radicle from benzaconine produces a transformation in its physiological effect. Instead of, for example, depressing the heart, aconine acts as a slight tonic to it. Both benzaconine and aconine are to some extent antagonistic to aconitine, the latter possessing the most marked effect in this direction. This is of interest in connection with the fact that both of these substances occur in the plant from which our medicinal preparations are made.

Of a very different kind is Moore and Row's research on piperidine, coniine, and nicotine. The primary object of the research seems to have been to discover what share the two constituent groups of the nicotine molecule play in the physiological action of the drug. Unfortunately, the constitution of nicotine is by no means settled. According to one view (Etard's), it is a piperidyl-pyridine; according to another and more

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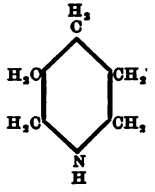
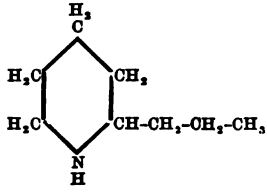
probable (Pinner's), it is β-pyridyl-methyl-pyrrolidine. In the former case, both rings belong to the six-membered group; in the latter, one (pyrrolidine) is a five-membered ring. Moore and Row do not give their adherence to either view, but they state that it is probable that pyrrolidine and piperidine are allied in physiological action. This may be true, but the assumption is nevertheless unjustifiable. The investigation of pyrrolidine ought to have preceded rather than succeeded (they hope to study its action later) the present research, to have made the paper of real value from a chemical-constitution point of view. As it stands, it is of most value if Etard's formula be accepted; but there is little evidence in support of this.

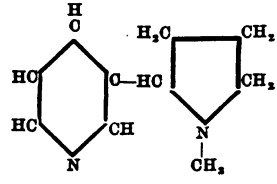
Coniine is α-propyl-piperidine; piperidine is hexa-hydro-pyridine. The formulæ of the compounds are as follows:—



Piperidine.



Coniine.



Nicotine (Pinner).

The authors were first attracted to the subject by the enormous rise in arterial blood pressure caused by intravenous injection of nicotine. Pyridine causes a fall in blood pressure, piperidine a distinct rise; and "preliminary experiments having made it somewhat probable that the effect of nicotine upon arterial blood pressure was connected with the presence of a reduced pyridine or pyrrol group in its molecule, we proceeded to test other piperidine derivatives with the view of ascertaining whether this was a common property of the reduced pyridine ring. Injections of piperine, the alkaloid of pepper, which contains piperidine united to piperic acid, was found to cause a similar though less extensive rise, while coniine produced a still greater rise than piperidine itself." The three alkaloids also possess other similar physiological properties, although they vary in intensity, and the authors believe that this similarity is due to the presence of the reduced pyridine (or pyrrol) ring in each molecule. The intensification of the action is dependent on the kind of radicle in the side chain. The points of similarity in physiological action are summarised as follows:—(1) The subcutaneous injection of each drug (in frogs) in sufficient doses causes complete motor paralysis. (2) This motor paralysis is mainly due to paralysis of the intra-muscular part of motor nerves; this is shown by the fact that muscle remains irritable directly but not through its nerve, when the poison has been allowed to circulate through the muscle, and that an

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unpoisoned muscle may be caused to contract reflexly through a spinal cord which has been subjected to the poison. We have not been able to demonstrate that there is no central action, but this, if present, must be slight. (3) The excised frog's heart is somewhat slowed, and the duration of the systole prolonged by each of the three drugs. (4) The heart *in situ* (in mammals) is at first slowed, but afterwards unaffected. (5) The arterial blood pressure is enormously raised, and the rise is due to constriction of arterioles and not to increased heart's action. This constriction of arterioles is independent of connection with the central nervous system, and is probably due to vaso-motor excitation in peripheral ganglia. (6) At a certain stage this vaso-motor mechanism probably becomes paralysed, for further administration of any of the three drugs no longer affects the arterial blood pressure.

An interesting fact brought out by the authors, as regards general effect, is that the four bases are about five times as active as their salts (hydrochlorides). The slow action of the latter they attribute to their gradual decomposition into the free base by the alkalies of the blood. They also believe that the paralysing action of these drugs is almost purely peripheral, acting probably upon the motor nerve terminations, and that any central action is small, even if present at all. As regards nicotine, this is in contra-distinction to the usually accepted view; but the authors' experiments have been carried out with considerable care, and certainly point in this direction. Personally, we feel inclined to attribute some central effect to nicotine, although accepting its peripheral action, and Vas, after nicotine poisoning, has found decided changes in the spinal nerve cells stained by Nissl's method. The physiological part of the paper is well done, but, in its present form, we cannot accept the authors' deductions as regards the influence of the piperidine ring, especially in the nicotine molecule. In the first place, it is very doubtful whether nicotine contains a piperidyl radicle, and in the second, a fact constantly overlooked by physiologists, the reactions of tissues are limited, so that widely different substances often produce very similar effects. *C. R. Marshall.*

"Digitalin."

According to Deucher (*Deutsch. Archiv f. klin. Med.*, Bd. LVII., Heft 2), digitalin serum does not possess all the properties of digitalin itself. Deucher has tried it in 40 cases where digitalin was indicated, giving it in alcoholic solution, in doses up to 5 milligrammes, by the mouth, and at times subcutaneously. Given internally, he found it had very little effect as a diuretic. Subcutaneously, it was more active, but it was not as useful as an infusion of digitalis. Subcutaneous injections of digitalin are apt to produce irritation, inflammation, and fever. Digitalis, Deucher found, did not cause the slowing of the pulse which digitalin does. On the other hand, it has not ny cumulative action.—*Centblt. f. inn. Med.*, No. 1, 1898.

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"Gastric dilatation."—*British Medical Journal*, April 9, 1898.

Mr. William Armstrong, of Buxton, in a paper read before the Harveian Society of London, pointed out that "Gastric Dilatation" might be divided into two groups: (1) Obstructive; (2) Idiopathic, the etiology and symptoms of which were discussed. The connection of gastric dilatation with phthisis and chlorosis was mentioned, as was also the fact that a very considerable number of cases of so-called latent or suppressed gout were caused by gastric toxins. The frequent occurrence of movable kidney in connection with dilatation was also touched on. The various methods of diagnosis were described, and special stress was laid upon "splashing" as a reliable symptom. The indications for treatment were (1) to distend the stomach as little and as seldom as possible, (2) to promote evacuation of the lagging contents of that organ, (3) to keep down fermentation, (4) to regulate the dietary, (5) to improve the tone of the general nervous system. With regard to the methods of treatment, the performance of gastro-enterostomy in very bad cases, where all other methods had failed, was spoken of, as was also the value of a weak solution of Carlsbad salt as a gastric evacuant. The great importance of antiseptics was dwelt upon, Mr. Armstrong's own preference being for fuming hydrochloric acid, 6 to 12 drops in 6oz. of water, and for small doses of calomel. Arsenic, strychnine, and kola were recommended as the best nerve tonics. The great value of lavage was recognised, but it was pointed out that it was only a palliative, not a curative, method of treatment. Massage was very valuable as a means of improving the nervous tone of the nervous system, but its local effects were disappointing; the modification known by the name of "electro-massage" was highly spoken of. Central galvanisation of the higher nerve centres was in certain cases most valuable, but its internal application by means of the gastric electrode was deprecated. The use of the needle bath and of packs of mustard bran over the sympathic ganglia in the neck and the solar plexus, was advocated. The advantages to be gained by mountain or high moorland air were noted. Bread, farinaceous foods, bulky vegetables, and milk were spoken of as being harmful in cases of dilatation. What little bread was taken should be twice baked, or cut very thin, and thoroughly torrefied. As little fluid as possible should be taken with meals, such fluid as was required for the purposes of the system being taken one hour before food.

Dr. Hare advocated emetics instead of lavage.

Dr. Ewart laid stress upon the indication of posture. Continued recumbency relieved the dilated fundus of any further downward stretching from the weight of its contents. More, however, could be effected by keeping the patient for long periods on an inclined plane, by planking the bottom of the bed and raising the foot end of it. This tended to raise the level of the greater curvature and to lessen its distance from the pylorus. Where no contra-indications existed, skilful local kneading, applied in a suitable direction at the proper interval after meals, undoubtedly assisted the stomach in emptying itself through the pyloric outlet. After a time the patient should be allowed to get up, but not before an efficient abdominal belt had been applied. This was another mechanical measure of great importance, but one requiring much care, an ill-fitting belt being often worse than useless. Dr. Ewart also dwelt upon the invariable presence of atony of the bowel and of associated inactivity of the liver, and upon the primary importance of treatment to be applied in that direction.

Dr. Herschell disagreed with Dr. Hare as to the possibility of replacing with advantage lavage by emetics. He thought one of the most valuable agents in the treatment of atonic and dilated stomach was Einhorn's intra-gastric spray. Another was mechanical vibration, which would often contract a dilated stomach when galvanism failed.

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Dr. Horace Manders said it was a great point in treatment to prevent the atonic stomach from degenerating into the true dilated variety. This was best done by preventing the ptomaines derived from the food from remaining in the stomach, and thereby poisoning the system; and the best means of accomplishing this object was by lavage and electricity combined. He had found a safe and effectual means of applying the constant current to the walls of the stomach by a specially prepared silk tube, in the circumference of which was woven a thin covered wire which terminated in a bare end about half-an-inch from the eyelet holes; hence, at one sitting the stomach could be well washed out, and whilst retaining the tube *in situ* with a requisite amount of water, the electricity could be turned on; the external rheophore should not only be applied over the gastric region, but also over the vagus on each side of the neck. The local treatment was completed by electro-massage in the direction of the longitudinal and oblique muscles of the stomach. In one case a cure had been finally effected by giving the last meal of the day at 6 p.m., and by washing the stomach out the last thing at night. By this plan the viscus was enabled to obtain the longest possible period of rest.

Dr. Goodhart was doubtful as to the effects of posture, but spoke highly of the relief afforded by well applied Martin's bandages.

Diseases of the Eye.

UNDER THE CHARGE OF CHARLES E. GLASCOTT, M.D.

DARIER (A.) "Treatment of purulent ophthalmia by protargol."—*La Clinique Ophtalmologique*, No. 6, 1898.

IN a recently published paper Dr. Darier makes the statement that we now at last possess an antiseptic capable of rapidly curing purulent ophthalmia, which has an increased efficacy, arising from the fact that it specially controls the gravest and most virulent form, that produced by the gonococcus. It is increasedly active the stronger the solution and the more frequently it is applied, and has the special merit of possessing no corrosive or caustic action on the tissues however concentrated the solution used may be; for this reason we need never fear that we have used too strong a solution, nor need we dread the occurrence of the deplorable results every now and again provoked by the too energetic application of lunar caustic. In how many instances have ulcerations of the cornea and pseudo-membranous conjunctivitis really had their origin in too energetic and ill-timed cauterisations with nitrate of silver, solid or in solution. None of these drawbacks exist with protargol; the solutions of this salt are the more mucilaginous the stronger they are, applied to the mucous membrane they are very slightly irritant, and as they do not coagulate albumen, nor are they precipitated by the chloride of sodium in organic fluids, they fully impregnate the epithelial cells, carrying deep down into the tissues their bactericidal

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properties. Nitrate of silver, on the contrary, when applied to the conjunctiva, destroys the epithelium, and at the same time, by becoming precipitated from its solutions, its action is limited to the superficial layers of the tissues to which it is applied—not to speak of the pain produced by strong applications of nitrate of silver, which is only surpassed by that caused by a solution of sulphate of copper.

Even in very concentrated solution—50 per cent—protargol does not cause the slightest opacity of the cornea, and the patient hardly feels the application, for it is only some minutes later that a slight smarting sets in. This pain is so little complained of by the patients that Dr. Darier has quite given up the use of cocain or other local anæsthetics before applying the protargol.

In his hands no application hitherto has been so generally beneficial in its action. If used within the first few days it has a marked abortive action, however virulent the source of the infection. He has seen cases where mothers who had been infected by infants suffering from very severe ophthalmo-blenorrhœa have been cured in a couple of days notwithstanding the signs of a grave infection, chemosis, swelling of the lids, and purulent secretion. The cases, however, came under treatment on the second or third day of the disease.

It is rare, however, to see cases of purulent conjunctivitis at the very outset, and when the gonococcus has invaded the deeper tissues of the conjunctiva it is much more difficult to reach, and, therefore, the longer treatment is delayed after infection the slower and more difficult is the cure.

It may now be asserted that protargol is absolutely innocuous, and that it may be used in the most concentrated solutions without fear of complications arising, and now that we are in possession of a curative agent which is equal, if not superior, to nitrate of silver, without exposing the patient to the slightest danger, we are not far from having at last a specific for this terrible disease, purulent ophthalmia, which is responsible for so much blindness.

Protargol is soluble in water in all proportions; the powder should be allowed to dissolve slowly in distilled water, stirring occasionally with a a glass rod; if the solution has been carefully made it need not be filtered.

A five per cent solution resembles Pilsener beer in colour, and froths when agitated, like all albuminous fluids. The stronger the solution the darker, thicker, and more syrupy. A 50 per cent solution is as thick and of the same brown colour as balsam of Peru.

The 5 per cent solution is the best to give patients to use at home as a lotion, to be used three or four times a day for the slighter con-

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junctival affections, or to be used after the surgeon has made his daily application in a stronger form. The stronger solutions do not cause any inconvenience, and are not more painful than the weaker ones for swabbing the everted lids; Dr. Darier uses 20 or 50 per cent solutions. The 20 per cent lotion is used in the great majority of conjunctival cases, the everted lids being swabbed carefully by means of a camel-hair brush. The lids should be swabbed daily or every other day, according to the intensity of the disease; in the interval two or three drops of a 5 per cent solution should be dropped into the eye.

In purulent ophthalmia if swabbing twice a day with 20 per cent solution does not cause a rapid improvement we must have recourse to the 50 per cent solution, which must be also used morning and night as long as the purulent secretion is abundant, and as it diminishes in quantity longer intervals should elapse between the applications.

We often find the purulence rapidly decrease, but we must not stop the applications too soon, and after it has entirely ceased, the use of 5 per cent lotion should be continued for a few days. In those cases where ulceration of the cornea already exists protargol does not seem to have much effect upon the healing of the ulcer, but it appears not to have any aggravating effect on the ulceration.

In pseudo-membranous conjunctivitis, where usually nitrate of silver is contra-indicated, at any rate in strong solutions, protargol does not increase the deposit of false membrane; on the contrary it often disappears after the first swabbing, but it is always prudent in such cases to swab very lightly, at all events at the commencement of the treatment.

Dr. Darier not only expects protargol to be of use in curing purulent ophthalmia, but also to render signal service as a prophylactic when used instead of nitrate of silver after Credé's method. The best solution used for this purpose is 10 per cent or 15 per cent, the instillation of such a strength giving rise to little or no irritation, and obviating at any rate the danger of producing spurious ophthalmias in delicate subjects by the use of an irritant, such as the classic 2 per cent solution of nitrate of silver.

SNEGUIREW. "On holocaïn."—*La Clinique Ophtalmologique*, March, 1898.

DR. SNEGUIREW is reported to have made the interesting and valuable communication to the members of the Moscow Ophthalmological Society that in prosecuting his experiments after the method of Bellarminoff, on the influence of holocaïn on the diffusion of fluids from the conjunctival sac into the anterior chamber of the eye, he found in all cases that

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holocaïn increases this diffusion, from which fact he concludes that holocaïn combined with atropine or eserine should give better and more rapid results than where cocaïn is used in combination as at present.

FOVEAU DE COURMELLES. "The perception of X-rays by blind persons." *Journal d'Hygiène*, April 14th, 1898.

DR. FOVEAU DE COURMELLES examined two hundred and forty of the inmates of the Institution des Jeunes Aveugles, with the assistance of M. Ducretet, Dr. Landolt, the well-known ophthalmologist, being responsible for the diagnosis of blindness in each case. Every precaution was taken to prevent suggestion, by using apparatus which produced a continuous note, whether the Crookes' tube was in circuit or not. Only those individuals who could readily perceive the appearance or extinction of the X-rays were made the subject of further investigation. The X-rays were isolated by wrapping the Crookes' tube in black material, thus cutting out the cathodic and fluorescent rays. X-rays not being visible to the normal eye, their presence can only be detected by their action on a photographic plate exposed to their influence. Another series of experiments were undertaken to exhibit the fluorescent rays only, by interposing the platinocyanide of barium screen between the wrapped up tube and the observed eye. In the third series the tube was left quite uncovered, with the object of showing the very luminous cathodal rays.

The following is a summary of the results obtained: Of the two hundred and forty inmates, thirty-six, having almost normal vision and employed as monitors and other sighted occupations, were eliminated; of the remaining two hundred and four, only nine individuals—five girls and four boys—when placed in the dark, were able to detect the presence of the X-rays issuing from a wrapped-up Crookes' tube. One girl, 18, with atrophy of the optic nerves, with slight perception of ordinary light, was able to distinguish X-rays, the cathodic, and the fluorescent rays. A second girl, aged 14½, with atrophy of the eyeballs, also possessing slight perception of light, was also able to distinguish all three varieties of ray given off by the tube.

A third girl, 16½, with adherent leucoma of both eyes, and hardly any perception of light, saw X, cathodal, and fluoreseent rays.

A fourth, absolutely blind, aged 18, with partial atrophia bulbi of the left eye and buphthalmus of the right eye, distinguished the X-rays, better the cathodal rays, and fluorescent rays not at all.

The fifth girl, aged 23, with "good perception," recognised the X and cathodal rays as being of a "bright red colour, like the sun."

Of the blind boys, only three perceived X-rays, or any manifestation of light at all. The first, aged 13, with atrophy of both eyeballs, was

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readily able to perceive all three varieties of ray; the second, also 13, with no perception of normal light, also could see all three; a third, 15½, absolutely blind from purulent ophthalmia, recognised the X-rays, but hardly the others at all.

Two persons, both totally blind, a boy and girl, complained of pain when exposed to the rays from the Crookes' tube; in the girl's case the pain persisted during the whole exposure, but in the boy's case very soon passed away.

Sixty-four boys and seventeen girls, subjects of atrophy of the optic nerves or of the globe, and totally blind, could neither perceive light from dark, nor were they able to recognise the presence of any sort of light from an excited Crookes' tube.

In some other cases subjected to experiment, who were able to distinguish light from dark, only cathodal and fluorescent rays were recognised, the first more readily than the second.

Contrary to what has been asserted by investigators who have only had a very limited number of patients to work with, persons totally blind from central causes do not recognise any variety of ray; only those patients blind from peripheral lesions, and possessed of only the faintest perception of normal light, have been able to perceive X-rays, while others who were only partially blind could not see them at all.

It is quite evident that no definite conclusions can be arrived at from this series of recorded experiments, notwithstanding the large number of blind persons examined, but it does appear probable that in certain cases of total blindness the retina had acquired a hyperæsthesia comparable to the sensitiveness of a photographic film with regard to X-rays; but the impudent claims of certain charlatans to "restore sight to the blind by means of X-rays," which every now and then appear in the public press, may be finally discredited.

FROMAGET (C.). "Aqueous extract of suprarenal capsules in ophthalmology."—*Annales de la Policlinique*, March, 1898.

THE function of the suprarenal capsules ever since the days of Addison have been the subject of infinite investigation and learned hypothesis. We here restrict our researches to the vaso constrictor phenomena produced by their aqueous extract. Fromaget has investigated this action from a three-fold point of view (1) as a vaso constrictor in external inflammation of the eye; (2) as a hæmostatic; (3) as an adjuvant to the action of cocain on inflamed tissues.

His experiments seem to show that an aqueous extract of suprarenal gland in all cases of catarrhal conjunctivitis and blepharo-conjunctivitis produced remarkable vaso constrictor effects. One minute after the

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instillation of a few drops, the bulbar and palpebral conjunctiva becomes blanched, and the eye presents its normal aspect. The rapid transformation is a striking one, and is rendered more so if only one eye is treated at a time.

This anæmic condition of the conjunctiva lasts for an hour, and sometimes two; a suggestion is here thrown out that the extract might be used for purely cosmetic reasons under certain circumstances. In keratitis, iritis, and irido-choroidal affections the same blanching of the conjunctiva occurs, but the circum-corneal injection does not entirely disappear, and the duration of the effect is much shorter, for this reason, its use cannot be recommended as being beneficial in any but conjunctival affections. As regards its action as a hæmostatic, repeated trials have proved it to be of great use in staying hæmorrhage after the removal of tarsal tumours or conjunctival operations. Bleeding ceases immediately upon the application of the extract, and does not recur.

As an adjuvant to cocain in producing anæsthesia of inflamed tissues its efficacy has also been demonstrated. Cocain, as is well known, does not act readily on tissues which are engorged by inflammation, holocain does so to some extent, but not very satisfactorily. If, however, the tissues are rendered anæmic by suprarenal extract, cocain at once produces its anæsthetic effects. Fromaget mentions two cases of traumatic cataract complicated by iridocyclitis he operated on painlessly, also a case of acute glaucoma in which iridectomy was performed without appreciable pain; he also gives other instances which bear out his statement. From the above observation it may easily be imagined that the aqueous extract of the suprarenal capsule is of very great use in ophthalmic practice, but, unfortunately, its price is still almost prohibitive, and the results obtained by the samples of extract in the market are variable, owing chiefly to certain changes that take place in the solution by keeping, and also to imperfections in the mode of manufacture. It is to be hoped, however, that these drawbacks will be speedily overcome.

Kiernan (Jas. G.) "Hysterical double ptosis."—*Medicine*, Oct., 1897.

Hitzig, of Halle, points out in a recent article that, as has long been observed, disorders of the oculo-motor mechanism are comparatively rare in hysteria, though disorders of the field of vision and phenomena due to fatigue are very common. He cites the following case:—A Polish labourer, aged 36, had previously suffered from "inflammation in the eyes"; in August, 1895, he wounded himself in the leg; the wound healed rapidly, but the patient became seized with the idea that as there had been no suppuration inflammation would occur elsewhere.

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After a week he really got an inflammation in the eyes, followed by diplopia and ptosis; this condition lasted a long time, till in September, 1896, he had an attack of insanity, and attempted to drown himself. On admission (Sept., 1896), there was complete bilateral ptosis, and both eyes were turned inward and downward. In November the pupils did not re-act to light, and the patient professed to be able to see nothing. There was no evidence of orbicular spasm; there was partial unilateral loss of taste and smell. Tactile sensation was absent over the whole body, and there was analgesia of the right arm, left leg, left half of the trunk, neck, and head. Temporary improvement of the eye symptoms had followed chloroform narcosis in October, but their complete disappearance did not take place till the end of November, as a result of electricity and suggestion. A temporary partial hysterical deafness was recovered from a little later. In January, 1897, the patient's condition was practically normal in every respect. The squinting and myosis were evidently attributable to spasm. This case is ascribed to hysterical paralysis of the levator muscles of the lids, and it tends to disprove the views held by Charcot in 1888, but afterwards abandoned by him, that all so-called hysterical unilateral paralyses of the facial, lingual, and oculo-motor muscles are in reality hemispasms.

Dr. Kiernan's case tends to corroborate the view taken by Hitzig. Here the patient, a multipara, aged 33, comes of a family rife with neurotic taint. Neuroses of various types are frequent in this family for three generations. One sister had periodical attacks of nymphomania. The other children suffer from cerebral phenomena from very slight causes; one brother had infantile hemiplegia with athetosis. There have been numerous children for three generations, the greater portion of whom died in infancy.

The present patient has visceral neurosis simulating peritonitis and gallstone colic, attended by pyrexia, followed by apyretic states when the temperature falls from 109° to 90° in a few hours without corresponding constitutional disturbances. Paralysis and local anæsthesia are easily produced in this state by suggestion. On one occasion discolourations of the skin resulted from an accidental suggestion that the skin looked slightly reddened at the seat of a paræsthesia.

After one of her attacks of visceralgia simulating gallstone colic, which left her very weak, the suggestion was made by a neighbour that "her eyes looked weak," whereupon slight amblyopia resulted, followed by double ptosis. The "visceralgia" disappeared under what was chiefly moral treatment, but the ptosis persisted for some weeks. One day while the patient was relating her symptoms she was much startled by the fall of a window, and she passed into a hypnotic state.

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While in this condition the suggestion was made that her ptosis was under full control of her will, and that she would hereafter be able to control it. On awakening from her hypnotic state the ptosis and amblyopia disappeared.

The last attack occurred under the following circumstances: The patient, while in an eastern city, had been treated for headache by the correction of refractive errors by glasses. Soon after her return to Chicago she suffered from very obstinate suboccipital headache. Through much talk by her friends she was persuaded that the headache was of optical origin, and that the glasses had been improperly fitted.

She was found to be badly constipated; the persuasion, however, that the eye had been improperly corrected by glasses continued. She finally had a recurrence of the old symptoms of ptosis and amblyopia. The condition, however, disappeared with the removal of the headache, which yielded very rapidly to dieting and cathartics. Since this time (12 months ago) there has been no return of the ptosis, and there has been no complaint of either eye strain or headache.

Charles E. Glascott.

Diseases of the Throat and Nose.

UNDER THE CHARGE OF A. HODGKINSON, M.B., B.Sc.

GLEITSMANN. "Report of the progress made in the treatment of laryngeal tuberculosis since the last international congress."—*Journal of Laryngology*, December, 1897.

MURRAY. "The treatment of laryngeal phthisis."—*New York Medical Journal*, January, 1898.

IN the opinion of Gleitsmann we are compelled to acknowledge that during the last few years not only has satisfactory progress in the treatment of laryngeal tuberculosis been effected, but also that in many directions diligent efforts are being made to overcome our deficiencies and to improve our methods.

The treatment of tubercular laryngitis can be very properly grouped under three headings, viz, the medicinal, the local, and the surgical treatment, although a combination of two, or of all three methods, is often advisable and necessary.

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As to the employment of medicinal agents the author mentions and approves of the creasote preparations, especially their carbonate combinations. Satisfactory results have not, on the other hand, followed his injections of tuberculin and its products or serum. Antiphthisin has produced good effects in the hands of von Ruck, of Ashville, N.C. Gleitsmann has had no experience with Maragliano's serum, and the new tuberculin of Koch is still *sub judice.*

Of local applications the author mentions Rosenberg's well-known injections of menthol in olive oil. Botey's injections of creasote and guaiacol have been successful. He injects a one or two per cent solution in olive oil in doses gradually increasing from three to twenty grammes. In more than half the number of patients in whom this treatment was adopted the pulmonary symptoms had remained stationary, the expectoration and cough had lessened, and the general condition improved. About half the number of patients he claims to have cured by two months' treatment. Barton has given intratracheal injections of benzoinol, europhen, and menthol with satisfactory results. There is an almost universal consensus of opinion in the efficacy of topical applications of lactic acid; similar good effects have been observed from the use of sulphoricinate of phenol (Ruault). This compound, in the opinion of Herzug, not only promotes the healing of tubercular ulcerations, but also absorption of infiltrations. Parachlorphenol is spoken highly of by Simanowsky, Spengler, and others, both on account of its curative properties and its anæsthetic powers. Objection has been raised that the remedy is too painful, and that it is not more effective than creasote or chloride of zinc. Murray speaks highly of a new preparation—euzymol, as a valuable auxiliary to the curette and lactic acid. It is non-irritating, and possessed in a high degree of the property of digesting necrosed tissue and thus removing the detritus observed on the surface of tubercular ulcers.

The surgical treatment—the most modern and radical measure—comprises nine different procedures, viz., incision, curettement, sub mucous injections, electrolysis, galvanocautery, laryngotomy, laryngectomy, tracheotomy, and intubation. Curettement has been slow to find general recognition in suitable cases, for a two-fold reason. First, that it is generally impossible to eliminate the concomitant pulmonary disease to which ultimately the majority of sufferers succumb; second, that it is difficult to remove all the tissue which is diseased and to prevent relapses. As to the first objection the laryngologist is in the same position as the surgeon who does not hesitate to remove a tuberculous articulation without hoping to cure thereby the tuberculous diathesis. The second objection is met by a proper selection of cases. As to relapses, we cannot forestall them by curettement, but they will not be

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more frequent but rather less so than with other methods of treatment. Curettement, in the author's opinion, is indicated:—(1) In cases of primary tuberculous affections without pulmonary complications; (2) in cases with circumscribed ulcerations and infiltrations of the larynx; (3) in cases with dense hard infiltrations of the arytenoid region of the posterior wall, of the ventricular bands, and also tuberculous tumours of the epiglottis; (4) in incipient phthisis with but little fever and no hectic symptoms; (5) in advanced pulmonary disease, with distressing dysphagia, resulting from infiltration of the arytenoids, as the quickest means of giving relief. The contradictions for curettement are:—(1) Advanced pulmonary disease and hectic; (2) disseminated tuberculosis of the larynx; (3) extensive infiltrations, producing severe stenosis, when tracheotomy is indicated, or laryngotomy can be taken into consideration; (4) in timid, distrustful, nerveless patients. The technique of the operation has been greatly facilitated by Herzug's rotary double curette. Gouguenheim has constructed an instrument which, being larger than Krause's curettes enables him to remove a greater amount of tissue. Submucous injections of lactic acid have given the author satisfactory results in a number of cases in which curettement was either objected to or considered inappropriate. Chappell, of New York, has used the creasote treatment in his clinic during the last two years in the form of sprays, pigments, and submucous injections. For the last-named he uses wintergreen and castor oil as a vehicle in the proportion of one drachm of creasote to the ounce.

To electrolysis belongs cataphoresis, a new contribution to the treatment of laryngeal tuberculosis (Scheppegrell). Spherical electrodes are used of chemically pure copper, since the oxychloride of copper is a salt possessing marked germicidal properties while exerting a stimulating effect on the pathological tissues. Scheppegrell claims (1) that there is no real destruction of the tissues, nor are there lacerations of the surfaces; (2) that there is neither reaction nor hæmorrhage; (3) that the high degree of skill required for curettement is not required; and (4) that it is applicable to all cases of laryngeal tuberculosis.

In regard to laryngotomy and tracheotomy Lohoff, Crepon, and others have placed their observations on record. One patient, operated on by Hopmaren (laryngotomy) was still able, after eleven years, to preach in a loud though somewhat hoarse voice.

Murray, in a paper read before the American Laryngological Association, reports on the progress made in the treatment of laryngeal phthisis since 1893. Of the many remedies suggested in the treatment of this disease the curette and lactic acid must be accorded the first place. Next should come the phenol preparations, as advocated by Spengler, Hedderich, Herzug, and others. Laryngotomy should only be

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resorted to under most exceptional circumstances. Tracheotomy has its value, for without a free supply of good air nothing can be expected in the treatment either of pulmonary or laryngeal phthisis. Euzymol has been found by the author a most valuable auxiliary to the curette and lactic acid. It is non-irritating, and digests necrotic tissues.

Eugene S. Yonge.

THOMSON (ST. CLAIR). "Inunction of mercury in tertiary syphilis of the nose and throat."—*The Laryngoscope*, January, 1898.

THE author comments on the generally accepted view that mercury is the correct treatment for the primary and secondary manifestations of syphilis, and iodide of potassium for the tertiary. He traces this idea to its "fons" in standard text-books, and quotes Erichsen and Hutchinson, senior and junior, who give the iodide of potassium the chief place. He does not question the correctness of this view in general, but with regard to the choice of the remedy and how to apply it quotes Fournier, who speaks of "the empirical action of certain methods in certain cases," and who believes, for instance, that in slight syphilitic erosions of the tongue and desquamative glossitis, injections of calomel are the more efficacious than mercury administered by mouth or by inunction.

Hutchinson (senior) makes no mention of mercury, except as a caustic local application, in the treatment of phagedena of the nose, and with regard to administering mercury by the skin says, he "keeps the skin methods in reserve for exceptional cases, and under all ordinary circumstances administers the remedy by the mouth."

The author has frequently seen in tertiary nose and throat disease the inefficacy of Hutchinson's pills, and mentions a case, treated off and on for three-and-a-half years with grey powder by a well-known syphilographer, from which he removed a piece of necrosed vomer six months after discontinuing treatment. There was at the same time a suppurating gumma on the vertex, and a large node on the tibia. Under inunctions of mercury there was rapid improvement in a week, and now a year later there is no external disfigurement of the nose. In many cases he has used for a couple of months hydrag. c. creta pills usually with iodide of potassium, either with improvement (though not so rapid as in secondary stages) or with inappreciable or no improvement. This treatment he has followed by inunctions of mercury, and the comparative rate of progress has been remarkable. Indeed in all his cases of undoubted tertiary disease of the nose and throat improvement was invariably decided and rapid when conditions permitted the administration of mercury by the skin. Fournier says, that

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generally speaking we may say, administration by the mouth for cases of normal syphilis, inunction for severe cases, injection for the worst types. Tertiary syphilis of the throat and nose in the large majority of cases assumes a severe form, and the disfigurement resulting therefrom is serious. After pointing out that collapse of the bridge of the nose does not depend on the loss of the septum, he goes on to say that in his experience the portion of the upper air tract where the least satisfactory results are obtained is the larynx, and in advanced cases the trachea.

He prescribes six drachms of unguent. hydrargyri in six separate packets of oiled paper, and gives full details for the inunction; six different regions are selected for six nights. The patient takes a warm bath the first evening before inunction, and if he can take one daily he is recommended to do it in the morning, and if this is not possible, then a weekly warm bath on the seventh evening and no inunction. The effects at first should be constantly watched. Teeth and gums should be put into healthy condition. Teeth should be brushed thoroughly at least morning and evening, and after meal a chlorate of potash or antiseptic mouth-wash used.

The necessity of secrecy in some cases makes this treatment difficult, and sometimes it is well to have it carried out at Aachen (Aix-la-Chapelle), Arkansas, or other sulphur springs.

The number of inunctions necessary varies; but, roughly speaking, 25 to 30, or even 40, are required. The amount to be used will range from 20 to 60 grains at each inunction. Then the "chronic intermittent" plan must be followed for the treatment of latent syphilis. As a rule, he gives no further inunctions for six months, when he advises fifteen more. This is repeated on two further occasions, each time after six months of rest from treatment. If no further symptoms appear, the patient is simply put on his guard to observe any recurrence. If, however, the symptoms are very obstinate, and reappear readily in the six months intervals, hydrarg. c. creta is used in full form two, three, or more times a day.

The author has no personal experience of calomel fumigations or hypodermic injections.

Local treatment, not too energetic, should not be neglected. It consists of cleanliness, antisepsis, the use of mercurial lotions, judicious use of escharotics, such as the acid nitrate of mercury, in the strength of 1 to 8; then curette and knife. Where a painfully-affected tongue prevents application of medicaments to larynx, use a perchloride of mercury spray (1 in 2,000), or inhalation of fumes of calomel.

Robert M. Fenn.

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Anatomy.

UNDER THE CHARGE OF ALFRED H. YOUNG, M.B., F.R.C.S.

ROLLESTON (H. D.) and HAYNE (L. B.). "Congenital hypertrophy of the pylorus."—*British Medical Journal*, April 23rd, 1898, p. 1070.

AFTER alluding to the rarity of congenital hypertrophy of the pylorus, the authors refer to seventeen cases which have been previously recorded, with post-mortem examination. The case now described was met with in a male child, aged eight weeks. At the post mortem nothing abnormal was noted in any of the organs excepting the stomach. The pyloric end of the viscus was markedly thickened; it was about three-quarters of an inch long, and the lumen was about the capacity of a No. 4 male catheter. Microscopic examination showed that the muscular coats, more especially the circular, were hypertrophied; they presented no other change. The submucosa was condensed, and the mucous membrane showed some catarrh. With respect to the cause of this muscular hypertrophy the authors give a brief summary of the conclusions arrived at by Thomson (*Scottish Medical and Surgical Journal*, June, 1897). He believes that it is due to nervous incoordination, which leads to simultaneous contraction of the stomach and the pyloric sphincter, and so to overwork of both; and he proposes the name of congenital gastric spasm for the condition. As there is no evidence of irritation of the mucosa, Dr. Thomson dismisses the suggestion, made by himself, that the pyloric spasm may be due to some irritating property of the liquor amnii swallowed in the later months of intra-uterine life by the fœtus. Dr. Rolleston and Dr. Hayne, however, point out that the mucous membrane is described in some of the recorded cases as being inflamed, and consider that "though this may be a secondary result of the spasm, it prevents this ingenious suggestion being put entirely aside."

SMITH (HEYWOOD). "Uterus unicornis."—*Lancet*, April 16, 1898.

THE case here recorded was observed in the living subject. A woman, thirty-three years of age, had one child two-and-a-half years old; symptoms pointing to the existence of an inflamed and and probably adherent left ovary, and a prolapsed right ovary, determined operative interference. The right oviduct and ovary were distinguished, the ovary was "a little larger than normal, with the distal one-third distended with blood, and

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a scar at its extremity blood-stained; there were several small cysts, but nothing abnormal." On the left side there were no rudimentary structures, no broad ligament, no round ligament, no ovary, and no oviduct. The uterus was elongated, its fundus instead of being broad and flattened antero-posteriorly was rounded at the top and on the left side, which was quite smooth down to the bottom of the pelvis. A swelling felt on the left posterior aspect of the pelvis proved to be the left kidney, two-thirds of which lay below the brim of the pelvis. The right kidney was normal in position. Dr. Heywood Smith adds some brief abstracts of the records of similar cases. *A. H. Young.*

Corner (E. M.). "The morphology of the triangular cartilage of the wrist."—*Journal of Anatomy and Physiology*, January, 1898.

The triangular fibro-cartilage of the wrist may be either a carpal element or a specialised part of the capsule of the joint. From the evidence which Mr. Corner has collected, it would appear to be a product of the fusion of both; that is to say, it is built on a vanished carpal element, so that the adult structure is mainly derived from the capsule of the joint.

Dissections of the wrist joints were made in the tortoise, ox, sheep, pig, dog, cat, monkey (cercopithecus), man (adult and fœtus).

In the dog the triangular fibro-cartilage is mainly fibrous in structure, and is closely connected with the capsule. In the cat the cartilage is larger than in the dog, and is also closely connected with the capsule. Professor Lebouc, in his paper on the morphology of the carpus, has described the development of the triangular fibro-cartilage. He has found a cartilage nodule in the carpus of the fœtus of three months, which he regards as the first trace of the structure. It is situated in a band of tissue joining the styloid process of the ulna with the semilunar bone. The cartilage usually disappears in the fifth month of fœtal life. He regards this nodule as the proximal extremity of the pisiform digit.

Mr. Corner then points out that the triangular fibro-cartilage is not present in those animals which have no power of rotation at the wrist joint, as in the sheep and pig; but that, as the capacity for rotation develops, fascicles of the capsule of the wrist joint are dragged into the articulation both from the flexor and extensor side, as in the dog.

The double nature of the cartilage is thus foreshadowed: The laying down of a cartilage nodule in a ligamentous band which has been derived from the capsule of the joint.

Mr. Corner suggests that this double nature of the fibro-cartilage may explain the cases of perforation of the structure occasionally met with.

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CADE (M.). "Un cas de malformation cardiaque congénitale. Absence de l'artère pulmonaire."—*Lyon Médical*, October 10, 1897.

THIS paper contains a detailed account of a rare form of congenital cardiac malformation, with absence of the pulmonary artery. Of the large number of congenital heart cases which have been reported only about a dozen have shown a single artery springing from the base of the heart, instead of the aortic and pulmonary trunk. M. Cade describes the case of an infant that lived for five months in spite of the absence of the pulmonary artery. During life the more prominent symptom was general cyanosis. On examining the heart nothing abnormal was discovered. There was no increase of the præcordial dulness, and no abnormal sounds.

At the autopsy it was found that—(1) A single arterial trunk arose from the base of the right ventricle; (2) the interventricular septum was incomplete above; (3) the interauricular septum was absent; (4) the two auriculo-ventricular openings were not completely separated from one another; (5) the arteries to the lungs arose from the under surface of the aorta by a single vessel which divided into two. Each branch was of large size, and represented both bronchial and pulmonary arteries.

The heart, with one auricle, two ventricles, and a single vessel arising from the base, closely resembles that of an embryo of from four to six weeks. At the fourth week of intra-uterine life, the heart possesses a single ventricular cavity, from which springs the single arterial bulb or stem, and an auricular cavity into which open three veins, two superior cavæ and the inferior vena cava. The interventricular septum has commenced, and the auricle communicates with the right ventricular cavity.

M. Cade's specimen is somewhat more advanced. The heart, however, has not attained the characteristic features of that of an embryo of seven weeks, since at this date the interventricular septum is completely formed, and the division of the arterial bulb into two parts—the aorta and pulmonary artery—has taken place.

The author, therefore, regards the case as an example of arrested development, which has occurred about the sixth week of intra-uterine life.

Among other interesting features, the absence of auscultatory signs is noteworthy. In similar cases previously recorded, Henoch, Peacock, Godhart and others have found that, as in M. Cade's case, there was intense cyanosis, without any heart murmurs. Other writers, especially Morrisous, state that a systolic bruit may be heard at the base of the heart, and may be conducted along the arteries of the neck.

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M. Cade suggests, in explanation of the absence of heart murmurs in his case, that the blood pressure in the two ventricles was equal.

Peter Thompson.

Auvray. "Plexus veineux du creux poplité. Artères du nerf médian. Anomalie du coraco-brachial."—*Bulletins de la Société Anatomique de Paris*, fasc. 5, Jan.—Fev., 1898.

The anatomical peculiarities described by M. Auvray are of practical importance, inasmuch as they would complicate operative treatment and might possibly impede diagnosis.

The veins he describes in the popliteal space consisted for the main part of three large trunks, one of which occupied the ordinary position in the upper part of the space; the second was internal to the first, and immediately posterior to the artery (it might easily have been mistaken for the artery in an operation for ligature); and the third separated the artery from the posterior surface of the femur.

The arterial abnormalities described are two cases of high division of the brachial into superficial and deep stems. In both cases the deep stem was continued directly into the comes nervi mediani, but in one case it passed through the median nerve in the forearm and completed the superficial palmar arch after communicating with the ulnar artery above the wrist. In this case both the ulnar and the radial arteries rose from the superficial brachial stem, but in the other the ulnar artery rose like the comes nervi mediani from the deep stem, and the comes nervi did not terminate in the superficial palmar arch, but in digital branches to both sides of the thumb and index finger, and to the radial side of the middle finger.

The anomalous coraco-brachialis was one of the not very infrequent cases of insertion of a special portion of the coraco-brachialis into the lower part of the internal intermuscular septum to the inner side of the brachial artery and median nerve, the two latter structures being enclosed in a musculo-aponeurotic space.

Arthur Robinson.

Walker (G. A.). "So-called retained nerve-sheaths in the retina."—*Philadelphia Polyclinic*, April, 1898.

The terms "opaque nerve fibres" and "retained nerve-sheaths," which are frequently used by ophthalmologists in their descriptions of the occurrence of myelin sheaths round some of the nerve fibres in the retina, are both objected to by Dr. Walker; the former on the ground that the term "opaque" is usually applied in reference to the eye to indicate a pathological state, and it is therefore misleading when used in connection with a normal, though occasional, condition; the latter

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because the nerve fibres grow from the retina towards the brain, whilst the myelin is deposited around them from the brain to the eye, as Bernheimer has shown. Therefore, any medullated nerve fibres which may be present in the retina have not retained their sheaths, but have acquired them by the extension of the myelin beyond the sclera, where it ordinarily stops. Dr. Walker proposes to avoid the objectionable terms by describing the nerve fibres under consideration as "medullated optic nerve fibres in the fundus."

Reviews.

"Nervous Affections of the Hand and other Clinical Studies." By G. Vivian Poore, M.D., F.R.C.P. London: Smith, Elder, and Co. 1897.

The book consists of twenty articles on medical subjects, which have been previously published by Dr. Poore in various journals. The first six articles are devoted to writer's cramps and other nervous affections of the hand. These articles are a summary of the author's important clinical researches on the subject, and include notes and observations on a large number of cases. They probably contain the most complete account in the English language of the symptomatology and treatment of writers' cramp and other allied conditions, and ought to be consulted by all practitioners who are called upon to treat these troublesome affections.

In 168 cases, in which difficulty in writing was the chief symptom for which the patient sought medical advice, an analysis showed that often one of the following diseases was the cause of the symptoms: General paralysis, lateral sclerosis, posterior sclerosis, progressive muscular atrophy, disseminated sclerosis, and paralysis agitans. But in 117 out of the 168 cases the diseases just mentioned could be excluded, and hence the author has grouped them together under the term, "the neuro-muscular group," or true writer's cramp.

The author points out the diminution of irritability to both faradism and galvanism which may be observed in the affected hand in writer's cramp. As regards treatment, he states that "the most treatable form of writing difficulty is that which is accompanied by tenderness of one or other of the nerve trunks." In these cases he attaches great importance to the application of a blister over the tender nerve trunk "at a point where it is superficial." In some cases a more chronic form of counter-irritation is indicated, and for this purpose a piece of capsicum plaster may be employed. When the nerve tenderness has been removed the "thorough rubbing and massage of the whole limb, but especially

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of the intrinsic muscles of the hand is very useful," but until the patient has got rid of the nerve tenderness no massage ought to be employed. In cases where there is no nerve tenderness massage may be commenced at once. The author also attaches much importance to galvanism, and to galvanism along with definite exercise of the muscles.

Other rare forms of cramp are considered, *e.g.*, tailor's cramp (of the hand), goldbeater's cramp, hammerman's cramp. Chapter V. is devoted to certain conditions of the hand and arm which interfere with piano playing. Chapter VI. is devoted to sawyer's cramp.

The remaining chapters of the book consist of articles and lectures on various medical subjects. Chapter VII. is devoted to myelitis. In this article three cases are recorded, and interesting points in the pathology and treatment are discussed.

Chapter VIII. is devoted to two cases of phosphorus poisoning. The similarity between acute yellow atrophy of the liver and phosphorus poisoning is pointed out. The author remarks that the question will naturally arise, "Are all or the majority of cases of acute yellow atrophy really cases of phosphorus poisoning?" He thinks that it is not possible to definitely answer this question, but the two conditions being clinically indistinguishable, there can be little doubt that phosphorus poisoning has been often mistaken for acute yellow atrophy, and it is important, before making a diagnosis of the latter affection, to investigate carefully the possibilities "as to the patient having had phosphorus administered either intentionally or accidentally."

An interesting clinical lecture on chronic lead poisoning is recorded in Chapter IX.

Chapter X. is devoted to food poisoning by sausages, tinned meats, etc.; and Chapter XI. to auto-intoxication. Clinical lectures on gout and on a case of hæmaturia following influenza form the subjects of Chapters XII. and XIII. The relation of slight degrees of albuminuria to life assurance, congenital heart disease, the management of chronic heart disease, and the treatment and management of pulmonary tuberculosis are discussed in Chapters XIV., XV., XVI., and XVII. respectively. In discussing the subject last mentioned, the author devotes five pages to a discussion of the value of garlic. He thinks that if any useful result is to be obtained by the employment of antiseptics in pulmonary tuberculosis, it is important to use one which is eliminated by the lungs. "The bodies containing the active principle 'allyl,' such as garlic and onions, seem to fulfil these indications, and seem worthy of a trial." . . . "The allyl compounds, such as allylic alcohol and oil of mustard, were shown by Koch to be strongly antiseptic, and to have a remarkable power of inhibiting the growth of the bacillus anthracis. In this respect they rivalled the salts of mercury." Dr.

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Poore has found garlic of distinct service in case of dilated bronchi with fœtid expectoration, and thinks it is worthy of trial in tuberculosis.

The last three chapters of the book are devoted to tumour of the lung, the sulphur waters of the Pyrenees, and laryngeal spasm.

"Anatomy: Descriptive and Surgical." By HENRY GRAY, F.R.S., F.R.C.S. Fourteenth Edition. Edited by T. PICKERING PICK, F.R.C.S. London: Longmans, Green, and Co.

IT is about forty years since the first edition of "Gray's Anatomy: Descriptive and Surgical" was published, and it has now reached the fourteenth edition. It speaks well for the first issue that throughout successive editions the original plan of the work has been so closely adhered to. It was, as we learn from the preface to a former edition, intended from the first for students of surgery rather than for the scientific anatomist, and for students it is one of the most useful text books; for the junior student, perhaps, the most useful. Little need be said about a book which has reached its fourteenth edition, except in respect of such new matter as may have been introduced. It will, therefore, be sufficient to observe that as a whole the book has gained by the careful revision to which it has been subjected, and particularly by the further additions Mr. Pickering Pick has made to the sections dealing with the bearings of anatomy on the practice of surgery. The Editor may be assured that this edition will not only maintain the reputation which the work has for so many years enjoyed, but will also increase it.

The introduction of many new illustrations has added to the value of the book, though it must be said that most of the new figures fall short, in artistic excellence, of the older illustrations—see, *e.g.*, the new illustrations in the section on the skeleton, particularly those showing the smaller bones of the skull, *in situ*, and also the separated bones of the hand and foot. We notice with regret in this section that the remarkable directions intended to enable the student to determine which side some of the bones belong to, are still retained.

The Editor draws special attention to the account of the development of the peritoneum, which has been added with a view of rendering the description of the peritoneum more intelligible. This account is taken from the last American edition of "Gray's Anatomy," and is written by Dr. F. T. Brockway. It is in many respects good, but it is also open to many objections. Thus the ventral mesentery of the stomach is only developed from a small part of the septum transversum, and it is misleading to describe or figure it as a large membranous fold into which the liver grows. In connection with the pancreas no mention is made of the ventral diverticulum, though surely this is quite as important as that growing from the dorsal part of the duodenum.

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Figs. 584 and 585 will not be easily understood by the student, and it is difficult to see what advantage is gained by the introduction of the terms "bursa omentalis" and "lesser omental pocket."

"The Blood: How to Examine and Diagnose its Diseases." By ALFRED C. COLES, M.D. With six coloured plates. London: J. and A. Churchill. 1898.

THIS treatise is likely to be of great value both to the consulting physician and to the busy general practitioner. It is at present the only British work on the subject; and, in several respects, it is superior to the American book on the Clinical Examination of the Blood, by Dr. Cabot.

The author modestly lays no claim to originality, but he has drawn from various sources, English, French, and German, a mass of information relating to the staining and microscopical examination of the blood, all of which is arranged with a view to its practical application in the study of such blood-diseases as anæmia, primary or idiopathic, and secondary or sympathetic.

In the first group are included chlorosis, simple primary anæmia, progressive pernicious anæmia, leucocythæmia (spleno-medullary and lymphatic), acute leukæmia, Hodgkin's disease or pseudo-leukæmia, and splenic anæmia.

In the second group of secondary anæmias we have an account of the general condition of the blood in malignant diseases, such as carcinoma and sarcoma; and in hæmorrhagic diseases, such as purpura, scorbutus, hæmophilia, hæmoglobinæmia, or hæmocytolysis.

Methods of examining the blood are given for malarial parasites, and in acute diseases such as typhoid fever, diphtheria, erysipelas; in acute affections such as acute rheumatism, pneumonia, pleurisy, peritonitis, meningitis, septicæmia, and pyæmia; and in suppuration.

The condition of the blood is given in syphilis and tuberculosis; in various general diseases; diabetes, gout, myxœdema; in diseases of the different organs; and in certain infantile complaints.

The descriptions of the several methods for the examination of the blood, and the use of the instruments employed, are given with great clearness and in full detail, and the diagnosis of the numerous ailments is carefully traced, both in the text and in tabular form.

For certain reasons, which he adduces, Dr. Coles omits the consideration of certain parasites of the blood, and no mention is made of its chemical examination, partly "because it is work that can only be done in a laboratory," and partly because the results of such investigations have not so far proved to be of much clinical value.

The illustrations are beautifully executed and true to nature.

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Throughout the work the aid to diagnosis that can be afforded by an examination of the blood is constantly pointed out, and we would especially call attention to the remarks upon the blood in carcinoma (pp. 180—181), from which it would appear that it may be possible at times to detect recurrence of the disease, after operation, by a careful count of the cellular elements.

"Respiratory Exercises in the Treatment of Disease." By HARRY CAMPBELL, M.D., B.S. Lond., F.R.C.P. London: Baillière, Tindall and Cox. 1898.

THIS is a most suggestive book, which we can warmly recommend. In the first nineteen chapters the author enunciates the physiological principles on which the respiratory exercises are based. He differentiates three types of respiration: pancostal, in which the clavicles and all the ribs are raised; lower costal, in which expansion takes place principally in the lower part of the chest; and abdominal, in which the chief factor is the diaphragm. He is careful to point out that the respiratory movements have other functions besides the aëration of the blood, having a profound influence on the circulation of the blood and lymph, and also, by rhythmically compressing the abdominal and pelvic viscera, materially assisting the functions of these organs. Dr. Campbell gives a useful warning against fixation of the chest with closed glottis, while using these exercises, on account of the interference with the circulation thereby produced. He therefore directs his patients to breathe steadily during the whole time.

The first lesson taught by the author is to dissociate costal from abdominal breathing, so as to acquire the knack of using either separately. Having mastered this, the patient is directed to undertake certain active exercises, in which these types of respiration are alternated, with or without the addition of movements of the upper extremities. Passive exercises are also used, in which the movements of the arms are effected by the operator, and in which expiration is assisted by compression of the thorax. Other exercises have for their object the development of the flabby abdominal muscles.

One of the most valuable chapters in the book is that on the treatment of Emphysema, which Dr. Campbell treats by exercises compelling the deepest possible expirations. Other diseases, in which he has obtained good results, are, bronchitis, phthisis, asthma, chronic pleural effusion, and diseases of the heart and nervous and digestive systems.

There are some slips which we were astonished to discover. We are quite accustomed to find the names of English authors wrongly spelt in foreign medical literature, but it seems almost inexcusable for an English writer to transform the name of such a distinguished physician as the

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late Sir George Johnson into "Johnstone," both on page 144 and in the index. Still more were we astonished to find Dr. Campbell, on page 43, describing the insertion of a tube into the mouth as an operation done *per oram!*

We mention these blemishes in the hope that when a second edition of the book is called for they may be rectified.

"Diseases of the Nervous System." By CHARLES E. BEEVOR, M.D. Lond., F.R.C.P., Physician to the National Hospital for the Paralysed and Epileptic, etc. London: H. K. Lewis. 1898. Pp. 431.

THE object of this handbook is "To enable students and practitioners to know how to examine patients suffering from diseases of the Nervous System, and to assist them to marshal their facts in a definite order, and also to serve as an introduction to the study of the large standard works on Neurology." We have quoted this sentence from the preface of the book, because it is important to bear in mind the exact object of the work in considering its merit. The reader, who expects to find in Dr. Beevor's book a condensed summary of all the most recent views and theories with regard to diseases of the nervous system and the pathology thereof, will be disappointed. The book forms one of "Lewis's Practical Series"; the nature of the work is eminently practical, and its chief object appears to be clinical diagnosis. Bearing the apparent object of the book in mind, we must regard it as a great success. Probably some of the general text books of medicine contain as many details respecting pathology and symptomatology, but we know of no single book in the English language, of exactly the same scope, which will serve so well as an introduction to the clinical study of nervous diseases.

The first 47 pages are devoted to the anatomy and physiology of the nervous system, only those points being considered, however, which are of practical importance in clinical diagnosis. A chapter is devoted to the method of "taking a case," and another to the modes of examination. Then follow descriptions of the diseases of the peripheral nerves, spinal cord, cranial nerves and brain; and, finally, other nervous affections are considered. The descriptions of the various diseases are given in a concise, clear manner, and the important points in the symptomatology, pathology, and treatment are well brought out.

The action of the ocular muscles, and the exact symptoms produced by paralysis thereof, are particularly well described, and we know of no account of this somewhat complicated subject which is so clear and yet so brief.

There is very little in the book that we would criticise. The number of illustrations might have been extended with advantage, and a few

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diagrams representing the pathological changes in the spinal cord, etc., would have been serviceable. The descriptions of the pathological changes are brief, but no doubt this is owing to the practical nature of the work. Occasionally we have noticed statements which, from their brevity, will be apt to mislead the junior student; in the enumeration of the causes of certain signs and symptoms we have occasionally found some omissions; and we have noticed the use of a few words, terms, and phrases which we do not think desirable, as, for example, "Ophthalmoscoping the optic discs." But these are only minor points, and we can strongly recommend the book to senior students as an excellent guide to the practical study of diseases of the nervous system.

PUBLICATIONS RECEIVED.

From J. and A. Churchill, London :—

"Chavasse's Advice to a Wife." (2s. 6d.) Revised by FANCOURT BARNES, M.D., F.R.S.E.

"Chavasse's Advice to a Mother." (2s. 6d.) Revised by GEORGE CARPENTER, M.D.

From Longmans, Green, and Co., London :—

"Failure of Brain Power (Encephalasthenia); its Nature and Treatment." (5s.) Fifth Edition. By JULIUS ALTHAUS, M.D., M.R.C.P., M.R.I.

From H. K. LEWIS, London :—

"Aphasia and other Speech Defects." (15s.) By H. CHARLTON BASTIAN, M.A., M.D., F.R.S.

From Young J. Pentland, Edinburgh :—

"Diabetes Mellitus and its Treatment." By R. T. WILLIAMSON, M.D., M.R.C.P.

From the F. A. Davis Co., Philadelphia :—

"Sajous' Annual and Analytical Cyclopædia of Practical Medicine." Vol. I.

From John Wright and Co., Bristol :—

"Diseases of the Upper Respiratory Tract." (8s. 6d.) Third Edition. By P. WATSON WILLIAMS, M.D.

From the Scientific Press, London :—

"Notes on Pharmacy and Dispensing, for Nurses." (1s.) By C. J. S. THOMPSON.

"The Schott Treatment for Chronic Heart Diseases." (6d.) Second Edition. By RICHARD GREENE, F.R.C.P., Ed.

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THE MEDICAL CHRONICLE:

A MONTHLY RECORD OF THE

Progress of Medical Science.

A CASE OF CLIMACTERIC INSANITY.

By JOHN BENJAMIN HELLIER, M.D. (Lond.),

Lecturer on Diseases of Women and Children in the Yorkshire College of the Victoria University, and Surgeon to the Hospital for Women and Children at Leds.

THE following case furnishes an interesting study of the genesis of insanity in a patient suffering from disorder of the uterine function and of the pathological relations of the menopause :—

Mrs. A. was 45 years old, mother of two grown-up children. She had then suffered for nine years from severe menorrhagia, which had caused great anæmia and weakness. The menorrhagia had first commenced after an attack of diphtheria, whilst living in an insanitary house. She had thus become a chronic invalid. Exertion brought on palpitation, and she appears to have avoided all fatigue. She was not able to walk twenty steps, for six years had been carried up and down stairs, and had not dressed herself for nine years. She spent her days lying upon the sofa. She had formerly been under the care of an eminent specialist, but had become resigned to chronic invalidism and helplessness. No local treatment had been adopted.

I could find no obvious pelvic disease on bimanual examination, nor any disease in any other part except the great anæmia. Her disposition was amiable and affectionate, and she was quiet and gentle in manner. She was described as being very sensitive, easily pained in her mind, easily moved to tears, nervous and over anxious about her children's health, and fearful about small matters. She had not been regarded as hysterical, and there was no history of insanity in the family. Recently some slight irregularity suggested that the menopause might be near. When I first saw her, the question of dilating and curetting the uterus was raised, but as she seemed to be improving a little under iron, and as the menopause was probably near, this was deferred. In April, 1893,

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she had a small abscess in the neck, due to the suppuration of a gland at the anterior edge of the sterno-mastoid; the cause of suppuration was not known. To effect a prompt and radical cure she was put under ether by a skilled anæsthetist, on April 19, 1893, and the gland was incised and scraped, the whole operation occupying perhaps five minutes. She took the ether well, and recovered quickly from it. From this time symptoms of mental alienation commenced. She seemed rather strange in the first few days after operation, and at the end of a week said to her husband: "I have walked five miles by inches"—a totally incoherent and irrelevant remark. She began to show unusual reticence, and loss of interest in household affairs. After this, there was constantly in her mind the idea that she was accused of having done something wrong, and she needed to be constantly assured that such was not the case. The conviction grew upon her that punishment and death were to overtake her and her children, on her account. She showed great ingenuity in self-accusation, and thought that every passing vehicle was coming to take her to prison. At the end of June she went to the Lake district. Whilst there she wrote a number of incoherent letters; all were destroyed. On her return, in August, she was found to be decidedly worse. She told me that in these letters she had accused herself of crime; that she knew that she was out of her mind at the time, but that the letters had got into the hands of the municipal authorities, and that she and her children were to be put to death in consequence.

In August, 1893, she suddenly ceased to menstruate. Her last two periods had been copious. She has not been unwell since.

Now we come to a specially interesting point. Her general health began to improve. She was eating and sleeping well. At the beginning of September she rose one morning, dressed herself, and came downstairs, to the great astonishment of her friends, who had not known her to do this for nine years. From this time she began to occupy herself with domestic matters. She gained flesh; her thin, flabby muscles developed and strengthened in a marked degree. Her family were so delighted at this physical resurrection that they were almost consoled for the time for the mental aberration. She showed no alienation from her husband and children, but rather a more demonstrative affection. On some days she would weep and moan a good deal; on others she would be quieter, and her attention might be occupied with ordinary matters for a short time, but she never forgot her delusions, and never had a lucid interval. She was quite easy to manage, and was not sent away for treatment, and no attendants but her husband and daughter were needed.

I reported this case to the North of England Obstetrical and Gynæcological Society, in April, 1894, and up to then no improvement could

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be recognised. The remaining notes were sent to me by her husband, for she has removed from the neighbourhood.

She first showed real improvement in the spring of 1895. This was very gradual. By degrees she took more interest in what was going on, although the delusions were never absent, the sphere of healthy interest gradually expanded, and the sphere of delusion contracted and became less real and less intense. In the spring of 1897 it could be no longer noticed. She has now (1898) an excellent appetite, and is stouter and stronger than at any period of her married life. She attends to all her household duties. She can walk a mile without resting. All her delusion is gone. She has a little more tendency to suspicion and irritability than before the illness. She has very little remembrance of her illness.

Remarks.—The causes which conspired to induce insanity in this case appear to have been as follows:—

(1) There was marked and prolonged anæmia, the loss at every period being very considerable. Anæmia is a potent cause of mental debility. (2) There had been nine years of chronic invalidism and sofa-life. This withdrawal from active participation in the business of life, and the abandonment of effort to rise and act is, from a psychical point of view, a most enervating factor. (3) The time of the menopause was approaching, which is one of relative liability to mental disorders.* (4) The spontaneous occurrence of suppuration in one of the cervical glands is probably evidence of an unsatisfactory condition of the general health. (5) The excitement connected with the performance of an operation, though only a small one, is, in a neurotic subject, an occasional factor in the production of insanity. An interesting discussion of this point occasions a paper by Dent, on "Insanity after Operations in General," in the *Journal of Mental Science*, April, 1896. (6) The "last straw" was found in the effect of anæsthesia, for in certain subjects, where a predisposition exists, anæsthesia may act as the determining cause of mental attacks.†

The rapid improvement in physical condition which coincided with the onset of the menopause is remarkable. It is attributable in the first place to the cessation of the menorrhagic drain on the strength, but the singular manner in which the bed-ridden invalid suddenly rose and walked and worked must be partly attributed to the diverted course of ideas in the mind, so that she was no longer bound by the conviction that she could not or ought not to rise and exert herself. The ultimate

* See a good paper on "Neuroses of the Climacteric," by Dr. Savage.—*Medical Press and Circular*, Nov. 8, 1893.

† See a paper by Dr. Savage on "Insanity following the Use of Anæsthetics."—*British Medical Journal*, Dec. 8, 1887.

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recovery of mind as well as body is most satisfactory. The question arises whether thorough local treatment should not have been adopted early in the case when it was found that the menorrhagia persisted, and made the patient so weak and incapable.

Thorough dilatation and curetting is indicated as a first measure in intractable menorrhagia. If after due trial and waiting this proves useless, there is then a strong case for oöphorectomy. It is better to induce an artificial menopause than to allow a patient to be permanently incapacitated by uterine hæmorrhage, especially seeing that small myomata are often the undiscovered cause of such a condition.

It has been said that oöphorectomy is sometimes followed by insanity. So is the natural menopause. It is possible that in the present case removal of the appendages might have been followed by the same mental symptoms that actually occurred. In that event the case might have been quoted with great plausibility as an example of the effect of oöphorectomy in causing insanity, but such reasoning would have been fallacious. The case would then have no more proved that oöphorectomy should not be performed than that anæsthesia should not be induced. On the other hand, it is possible, and even probable, that arrest of the menorrhagia by timely induction of the menopause some years before might have produced a rapid and permanent cure without any of the mental complication that caused so much distress.

SOME DOUBTFUL CASES OF VOLVULUS OF THE SMALL INTESTINE.

By WILLIAM THORBURN, F.R.C.S.,
Assistant Surgeon, Manchester Royal Infirmary, etc.

It is generally stated that volvulus of the small intestine is an exceedingly rare disease, and it is undoubtedly the fact that it is very seldom recognised upon the post-mortem table, or during an operation, while the few cases in which it has been so recognised have generally been examples of primary mesenteric elongation or adhesion, the abnormality of the mesentery producing or at least permitting the rotatory displacement of the intestinal coil. When, however, we notice the readiness with which a coil of intestine can be turned over upon its mesenteric axis, it will appear probable that such a condition might frequently occur during life; but it is equally probable that replacement would ensue with a like facility, and that we should therefore have either no clinical symptoms, or symptoms of a transient nature only, while we should not expect a persistent and fatal obstruction nor any post-mortem

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evidence of this variety of volvulus. Treves has adopted the hypothesis of a temporary and spontaneously reduced volvulus of the small intestine as an explanation of certain cases of acute intestinal obstruction, occasionally recurrent, which recover without surgical treatment, but neither he nor others have apparently actually observed the suggested condition.

The three following cases, which have come under the observation of the writer within the last few years, may perhaps be regarded as throwing some further light upon this subject:—

Case 1.—In 1896 I saw, with Mr. Priestley, of Fallowfield, a young gentleman, aged 34, who had been attacked some 36 hours previously with symptoms of most acute obstruction of the bowels. At the time of the seizure he was in fair general health, although not by any means robust, and no cause of abdominal mischief could be detected. He was suddenly attacked with intense griping pain and with shock so marked in character as to suggest perforation of the alimentary canal, and to lead to the expectation of immediate death. The gradual subsidence of the shock was followed by more characteristic symptoms of acute intestinal obstruction, and when I saw the patient the case was perfectly typical, and appeared to arise from a lesion—probably strangulation—of the small intestine. The abdomen was at once opened, and we found rather to the left, and below the umbilicus, a superficial coil of small intestine which was rotated on a radius of its mesentery. The intestine was empty below, and moderately distended above this point. The displaced coil was readily thrown back into its normal position; in fact, it practically fell back as soon as it was handled. At the two ends of the twisted horse-shoe shaped loop, where the intestine crossed itself, its wall was pale and its lumen contracted, as if from local muscular spasm over each of two segments, some six inches apart, and each about half an inch in width. These contracted areas also recovered their normal appearance under our eyes. The mesentery appeared to be normal, but the general condition of the patient was so bad that the operation was much hurried, and no elaborate examination was permissible. Three hours later the bowels were well moved, vomiting had ceased, and the patient appeared well except for extreme cardiac depression. About nine hours after the operation an enormous evacuation of fæces was again followed by extreme prostration and death.

Case 2.—In 1890 I saw with Dr. Woodcock, of Manchester, a man aged 50, who had been suffering for five days from complete obstruction of the bowels of sudden onset, and followed by symptoms of acute peritonitis. Within a few minutes of my palpation of the abdomen, and while we were discussing the question of operation, the bowels were suddenly and most freely moved for the first time for five days, and a second evacuation occurred within an hour or two. The extreme prostration which had previously existed was then greatly increased, and death ensued within six hours of the first evacuation. A partial autopsy revealed in the left iliac region a sharply defined segment of small intestine (ileum) six inches in length, entirely black, with loss of peritoneum, and clearly either gangrenous or on the point of gangrene at the time of the patient's death. There was no perforation, but a diffused sero-purulent peritonitis, most advanced in the left flank, in which region diffused suppuration had spread into the abdominal wall, while the left inguinal glands were considerably enlarged from metastatic lymphadenitis. This somewhat rare contingency is worth noticing as being highly likely to lead to a diagnosis of strangulated hernia. The mesentery was congested in the region associated with the gangrenous intestine, but

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presented no other abnormality. A careful search revealed no possible cause of strangulation, nor was there any mesenteric embolism, while *intra vitam* there was no evidence whatever of heart disease, or other cause of arterial occlusion.

Case 3.—On July 25th, 1895, I operated at the Manchester Royal Infirmary upon a man, aged about 25, who was suffering from acute intestinal obstruction, with symptoms of general peritonitis. No reliable history of the condition was obtainable, but it had lasted for several days, and was clearly rapidly approaching its termination in death. Abdominal section revealed a piece of small intestine, probably ileum, about eighteen inches in length, sharply demarcated from the distended bowel above and the empty bowel below, quite black in colour, stiff, infiltrated with effused blood, and probably already dead, although it was not perforated There was general septic peritonitis with sero-purulent exudation, but no evidence of any old lesion of the peritoneum, of strangulation, or of affection of the mesentery, other than recent congestion. Excision of the gangrenous bowel, with end to end anastomosis by Murphy's button, was adopted as a forlorn hope, but the patient lived only a few hours.

In the first of these three cases the existence of a volvulus of the small intestine is beyond doubt. The only possible question is whether that volvulus had existed for thirty-six hours and was the sole cause of the symptoms. The fact that its reduction was followed by immediate recovery of intestinal activity, and the emptiness of the bowel below the lesion appear to leave no doubt upon this head also. The most remarkable point about the case was, perhaps, the absence of any marked congestion in the rotated loop. It was exactly such a condition as we might expect to relieve itself under the influence of normal peristalsis. Possibly the extreme shock and general prostration of the patient was to a large extent a cause of failure of intestinal peristalsis. I have never operated upon a case of intestinal obstruction which appeared to offer such excellent chances of recovery, nor ever seen so severe a shock follow such simple manipulations, and I learn that this depression dated from the very commencement of the illness.

In the second and third cases there is, of course, no direct evidence of volvulus, both showing only a sharply localised gangrene of intestinal segments which were in no way displaced. No cause for such gangrene was, however, discoverable. Neither patient had any hernia, old-standing peritonitis, bands, or diverticula; in neither was there any recognisable cause of embolism, nor any local evidence of primary interference with the mesenteric circulation; neither gave any history of injury, or indeed of any known cause of abdominal disease.

That gangrene is exceedingly liable to follow volvulus is well known; and in its typical form, as it attacks the sigmoid flexure, this disease is characterised by the extreme acuteness of its symptoms, and the rapid deterioration and gangrene of the intestinal walls which it produces. The intestine is, in a volulus, placed in a position of even greater danger than in strangulation, not only because the mesenteric vessels are

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twisted in the pedicle, but because the affected region of the gut is generally distended with its own contents before the onset of the obstruction, whereas in strangulation it is usually empty. And, further, it is probable that fæces continue to enter a rotated segment after the displacement has occurred, and that they there continue to accumulate on account of the intestinal paralysis. The local injury and the consequent danger to life involved in such a condition, depend far less upon mere mechanical obstruction than upon congestion, permeability, and gangrene of the intestinal wall, and the fatal termination is generally the result of peritonitis or of intoxication with the products of the bacterium coli.

In volvulus we have, therefore, a competent explanation of Cases 2 and 3. In both the volvulus apparently became spontaneously reduced. In Case 2 reduction may have occurred at the time of my examination, but I am more inclined to regard it as of earlier date, obstruction having been afterwards maintained by the paralysis of six inches of intestine, and finally overcome by palpation. Had the primary displacement lasted up to within a few hours of death, we should have expected to find adhesions between the affected coils. In both cases a volvulus reduced at an early date would be capable of injuring the intestine to such an extent as to cause local congestion, thrombosis, and ultimately gangrene, which would be sharply localised as we here found it, so that such a lesion would readily explain the persistent obstruction, and the post-mortem appearances.

Although the above considerations lead me to regard these as cases of reduced volvulus, we cannot unfortunately deduce from them any new principles for diagnosis or for treatment. It is interesting to note that the patients are all males, that sex being specially prone to volvulus of all forms. Case 1 is also practically important, in illustrating a ready reducibility of the essential lesion, which might well have occurred without being noticed in the manipulations of examining the exposed intestines, so that operation might have failed to reveal any cause of ileus. It is also important to note that in two of the cases the relief of obstruction and the free escape of fæces was followed by rapid death, shock being apparently aggravated thereby, as in some cases of colotomy. These cases also strongly support the suggestion of Treves that cases of acute intestinal obstruction which have spontaneously recovered may have been examples of self-righting volvulus, but it would clearly be the height of folly to allow our practice to be influenced by so remote a possibility, even were it not the case that the danger of gangrene is by no means removed by a mere rectification of displacement.

The writer is induced to place these cases upon record by the fact that he is unfamiliar with similar experiences, but the "Transactions of

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the North of England Gynæcological Society for 1895" contain a somewhat analogous observation of Donald's, in which the hypothesis of a spontaneously reduced volvulus is adopted to explain the sharply defined gangrene of five feet of the ileum, which had caused death within 35 hours after a simple ovariotomy, during which there had been some difficulty in retaining the intestines within the abdomen.

PUERPERAL SEPTICÆMIA AND THE ANTI-STREPTOCOCCIC SERUM.

By ALFRED A. MUMFORD, M.D.

THE serum treatment of puerperal septicæmia has proved of such signal success in certain cases, and has so signally failed in others, that it is worth while to carefully examine all the clinical details of the cases where it has been used, and try to discern some guiding principles which will help us to choose those cases where we may anticipate benefit from its use.

Accordingly in the following pages, I have given very fully the clinical notes and treatment of an ingravescent septicæmia, which rapidly became fulminating, and which yielded to a combined treatment by serum and other methods. To it I have added notes of a case occurring in the same district where many of the clinical symptoms closely approximated it, but, though ingravescent, the case never became fulminating, ran a milder, though still severe, course, and was cured without the use of the serum.

The following are the notes of cases, the gravity of which is indicated not only by the temperature, pulse, and respiration, but also by the presence of acute nephritis and pericardial effusion, with some metritis and incipient peritonitis:—

M. W., æt. 33, fifth pregnancy, had suffered from minor febrile symptoms and rigor after her first confinement, when she had been delivered of a stillborn child. Her second confinement was normal. Her third child had died almost immediately after birth. Her second and fourth children were healthy. She had had several severe attacks of influenza during the last few years, and suffered from anæmia. She was a spare woman, and of a somewhat neurotic temperament. There were threatenings of premature labour at seven and a half months. At this time she had a skin cut over the middle joint of the finger, which was very intractable in healing, and on several occasions the inflammation spread to the wrist and to the nail. It healed up finally about seven days before the confinement. She was confined normally and easily on the evening of Thusday, March 24th, 1898. There was only a slight perineal tear and an old-standing cervical tear, apparently from an early confinement. The uterus did not contract very well, though there was no flooding. The placenta came away entire, and the membranes on careful examination seemed

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complete. She was ordered extract. ergot. liq., m. xx., and liq. opii sed., m. x., every three hours, as the afterpains on previous occasions had been very severe. She did not suffer from afterpains, but seemed exceptionally inclined to sleep, more than could be accounted for by the opiate. The evening temperature was 99. She slept through the night, and seemed well all the next two days, though she was very sleepy both day and night. The temperature was normal all day on the 25th and on the morning of the 26th. It was not taken on the evening of the 26th, as the patient felt very tired and wanted to go to sleep. On the night of the 26th, about 2 a.m., fifty-two hours after labour, when the baby was put to the breast, patient had a slight rigor. A double dose of opium and ergot was given and hot bottle, etc., applied. The temperature was taken an hour after, and was 98·8. Profuse perspiration set in, and the patient soon fell asleep. She woke up in the morning feeling very well, but the temperature was 101·6, and pulse 112; by noon it was 102, and the breasts were full and tender. The small perineal tear was examined, and showed healthy granulation. Lochia perfectly healthy, and no tenderness of uterus or abdomen. As the symptoms were explicable by the engorged state of the breasts, and as external infection was excluded by the knowledge that rigorous antisepsis had been maintained both by the nurse and myself, the case was taken to be due to nerve disturbance, and opium was again administered. The patient fell asleep again, and woke refreshed, but the temperature still kept rising, and at 8 p.m. had reached 102·8. An intra-uterine douche was given in case any clot had been retained in the somewhat lax uterus, and also to promote involution. The patient was rather restless, but ultimately fell asleep about 2 a.m., and slept well till 7 a.m. Two 4 grain doses of quinine were given.

Monday, March 28th. Slight frontal headache and pain in eyeballs complained of, but patient felt much better; the lochia were healthy; the bowels well moved; the temperature was 100·4, and the pulse 112. By 4 p.m. the patient had had a good sleep, and woke with a temperature of 103. After the bowels had again acted she slept again from 9-30 to 11-30 p.m. The bowels acted two or three times, and the headache was gone. She still seemed very feverish, and 1 grain of opium was given. She then slept from 1 a.m. to 7 a.m. Taking food very well.

Tuesday, March 29th. Woke up feeling well and comfortable; breasts more easy; temperature 100; lochia healthy; no tenderness anywhere. Quinine, 4 grains, to be given three times a day. By the afternoon the temperature was again up at 103—the pulse 112—but the patient did not feel ill. There were profuse perspirations and a catarrhal tongue. No sore throat whatever. The nurse noticed the urine was scanty and high coloured and reddish. Dr. Donald saw the patient at this time, and remarked on the old cervical tear, and suggested that there might be some absorption from this. The uterine douche was again used. The patient was very restless at night, but finally settled down about 2 a.m., and slept till 7.

Wednesday, March 30th. Very severe pain and swelling in left side; felt very sick, but only threw up a little mucus; slight tympanitis, but all relieved when the bowels had acted; complained of a neuralgic headache, and sharp intermittent lancinating pains; otherwise patient felt fairly well. Free purging was adopted, with great relief. 2-30 p.m., slight rigor. 3-15, profuse perspiration; temperature 105; pulse 150; patient not excited, but asking for something to send her to sleep; opium given. 8 p.m., no sleep; temperature 104·6; aperient given and enema used, and opium and quinine pushed.

Thursday, March 31st. By 12 midnight no sleep, but free perspiration. On this day she had not slept since early morning. After 12-30 a.m. she slept for half an hour. Restlessness now increased, and the breathing became very irregular; the

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tongue was brown and dry, but there was no delirium. There seemed to be a catch in the breathing, which was taken in gulps, about three or four to the minute, followed by very slight, shallow breaks, which could not be properly counted. The condition of the patient now seemed very grave. The pulse was not to be counted, being certainly over 170. Strong black coffee was at once given, and chloroform perles m. v., partly to expel the flatulence and partly with the hope that they would be absorbed into the circulation, and act as a diffusible disinfectant in the blood. An oxygen cylinder was procured by 6 and freely administered, and by 7-30 the pulse was much fuller and 120, and temperature was 103·2. The vigorous stimulation was continued. There was profuse perspiration, soaking through all the clothes. At 9-30 a.m. the temperature was 103, and the pulse 136. The anti-streptococcic serum was now administered, the dose being 10 cc. After this, the patient fell asleep very peacefully for an hour and a quarter. At 11 a.m. the temperature was 104, and pulse 140; copious perspiration; the breathing improving while the oxygen was administered, but tending to relapse into its gulping character when this was stopped. Dr. Donald again saw her at 11 a.m. 2-15, temperature 103·6°. The urine was now examined, and found to contain a large amount of albumin, as well as a large crystalline deposit of urates. The heart sounds were normal, though there was considerable fulness of the pericardium and dulness in the second left intercostal space. At 4-10 temperature 103·8; pulse 150; chloroform perles ordered, continued about every hour, and nourishment ordered to be kept up. By 8 p.m., *i.e.*, 10½ hours after the serum was injected, temperature 102, pulse 108, and by 9-30 patient had slept an hour and a quarter very peacefully, and she woke up with temperature 101, pulse 112.

Friday, April 1st. Peaceful sleep from 1 a.m. to 3-30; temperature 101; pulse 100; breasts painful and rubbed with oil. The gasping breathing returned to slight extent at intervals, but was at once relieved by the oxygen, which had an immediate, marked effect. The chloroform capsules were continued, m. v., about every four hours; coffee, oxygen, and persistent feeding, and by noon—that is, twenty-seven hours after the injection of the serum—the pulse had dropped from 168 to 86; the temperature from 105 to 99, and the breathing had become normal. That there still remained a good deal of poison in the system was evident from the symptoms which returned about 10 p.m. The temperature rose again. The patient felt chilly and began to shiver; the flatulency returned; yawning became very severe, and the breathing was very bad again at intervals; the tongue began to get dry; the pulse rose to 120, and the temperature to 103·6. The serum was again administered. The temperature began to fall, but the pulse remained very feeble and flickering. The vigorous stimulation by oxygen, coffee, and almost incessant feeding was kept up, and the pulse began to rally and regain its tone about 9 a.m., though still beating 120 a minute. Sharp lancinating pains in the left side kept recurring; the tongue was very dry, but the patient was conscious, and there was no delirium. Ether, m. v., was administered in perles, instead of chloroform, as a diffusible stimulant to the heart. The patient slept a little, but always awoke soaking with perspiration. Champagne was now added to the other stimulants, but the pulse remained weak and fluttering the whole day. By 8-20 the kidneys began to act freely, and the urine was again examined, and found to be much lighter in colour, and contained only a cloud of albumin, about $\frac{1}{10}$. At 9 p.m., serum was again injected, and the patient then settled off to sleep. She slept for about an hour at a time, and on waking was freely plied with food and coffee, while the oxygen was continued during sleep. By morning patient said she felt much better. She asked for and relished some bread and butter. The pulse fell to 120. There was no abdominal tenderness, except on very deep pressure; the tongue was moist; the breathing was regular; the heart

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sounds were fairly clear; and the dulness in the second left intercostal was diminishing.

A relapse threatened on the evening of Monday, April 4th, when the headache and dry tongue returned, but this yielded to a fourth dose of the serum. Things went well till Friday, the 8th—fifteen days from the onset of the fever—when a nettle rash appeared, and was very irritable by 12-30 p.m. The headache had returned with great violence; the tongue was dry; the pulse rose from 94 to 168, and the temperature from normal to 104. Serum was again injected, and ice cloths were applied to the head. The symptoms began to ameliorate about 7-30 p.m., when the temperature was 102, the pulse 148, and the respirations 32. By 10 p.m. there was a distinct improvement, and the temperature was 101·4; the pulse 130; the respirations 32. The now usual free stimulation by coffee, oxygen, ether perle, food, and champagne was kept up, and by 2 a.m. the patient was fast asleep; temperature 100·2; pulse 120—118; breathing regularly. From this time there was an uninterrupted recovery.

An incident in connection with this case was an attack of septicæmia from which a nurse in attendance suffered. It began with a vesicle near the nail of one of the fingers. Her illness lasted about a fortnight.

A bacteriological examination of pus from the nurse's finger was made by Professor Delépine, and he reported the presence of streptococci.

The special clinical features I wish to draw attention to are, first, that the general course of the fever was that of a "relapsing fever," and that the exacerbations were very virulent, amounting to a fulminating septicæmia. Strangely enough, a few months before there had occurred in this neighbourhood a somewhat similar case, but of a very much less virulent form. The patient was under the care of Dr. Arthur Pownall, to whom I am indebted for the notes of the case. This case ran its milder course uninterrupted by the use of the serum:—

Mrs. T., multipara, was confined of her 9th child on May 12th, 1897, and appeared to make good progress till May 22 (10th day), when she had a rigor and a temperature of 103·6, pulse 100, intense headache, coated tongue; the urine was never noticed to contain albumen, though it was examined several times both before and after the confinement. Temperature improved on 11th, 12th, and 13th days. Relapsed on 14th day, with intense headache, rigors, temperature 102°. Improvement on 15th and 16th days, with bad relapse on 17th. Gradual improvement, but relapse on 24th day. Then final recovery. There was persistent sleepiness, rigors, etc., but as the pulse never rose above 100, there was never any grave cause for anxiety. During the whole of the illness the patient slept well, except when the temperature was rising rapidly, when it was generally accompanied by rigors, and intense headaches. No local inflammation was discoverable which could account for the symptoms.

The case was seen by Dr. Sinclair and Dr. Leech on June 1st (20th day), who considered it to be of very obscure nature, and probably due to influenza. The interest in this case was that the exacerbation, though serious, affected the pulse and temperature and respiration to a less marked extent. There was no peritonitis or other local trouble. The intervals of remission between the exacerbations were less marked than where the

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serum was used; but a severe relapse came on the 24th day, and was repeated on the 25th, and to a less extent on the 26th before there was a complete recovery. The relapse was not accompanied by a nettle-rash. Finally, out of four nurses who attended the case, three were laid aside by febrile attacks resembling influenza. The profuse perspiration, the rigors, the sleepiness, the interval between confinement and date of appearance of symptoms, and, finally, the relapsing character are noticeable in many cases which have been reported in the medical journals. Several of the cases so reported seem allied to influenza, and clinically resemble the accounts given of relapsing fever, especially in the suddenness and virulence of the onset, while the remarkable way in which the dangerous symptoms of that disorder became suddenly alleviated without unusual treatment renders the part played by the serum more difficult of estimation.

Both my own case and Dr. Pownall's were marked instances of the clinical resemblance of this form of puerperal fever to relapsing fever.

CHRONICLE.

Medicine.

UNDER THE CHARGE OF JULIUS DRESCHFELD, M.D., F.R.C.P.

ERB (W.) "On paralysis agitans and its treatment."—*Zeitschrift für praktische Aerzte*, No. 5, 1898.

THIS article is the report of an interesting clinical lecture, given by Professor Erb at the Heidelberg Medical Clinic in January, 1898, and as it contains such a useful summary of the disease and its treatment, we have abstracted it somewhat fully.

Two cases are first described, which presented typical symptoms of the disease. The first case was that of a man, aged 61. The hands had the "writing" position, and constant tremor was present. The tremor was typical, and the movements of the fingers like those necessary for rolling a pill or "spinning." The patient had the power of holding out the hands quite still, and the tremor ceased during voluntary movement. He was able to bring a glass to the mouth and to perform other movements quite steadily. The difference between the tremor and that presented by a case of disseminated sclerosis was pointed out. In the latter case the tremor was made worse by voluntary movement, and the patient was unable to bring a glass to the mouth steadily. The second case was that of a man aged 44. Typical symptoms were present. The

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disease followed a severe fright. The patient was standing on the branch of a tree, when the branch broke, and he was in danger of falling from the tree into a brook which flowed underneath. He was terribly frightened, but succeeded in catching hold of another branch and came down to the ground without any injury. He had become dizzy from the fright and trembled all over the body, so that he could not continue his work. He went home, but the tremor continued in the right arm, and since then has not ceased. At first it was feeble, and did not prevent him doing his work, but in the course of a year and three months it increased gradually and extended to the right leg, and other symptoms of the disease developed. The symptoms remained stationary for 4½ years, and then, in consequence of great agitation (loss of money and anxiety), they became much worse, and the left side became affected. After making a few remarks on these cases, Professor Erb gives a summary of the chief symptoms of the disease. The tremor usually begins in the hands and fingers, with slight rapid oscillations, 5—7 per second, which at first are scarcely perceptible. The tremor consists of alternating contractions of the small muscles of the hand and forearm and their antagonists. The movements are usually similar to those which would occur in rolling a pill in the fingers. They are also described as spinning movements of the fingers. In the upper arm and shoulder the tremor is often absent for a long time. In the legs a similar tremor may be present, but it usually is slight. In rare cases the tremor of paralysis agitans begins in the foot. Usually the tremor is unilateral for a long period, it then extends to the hand of the other side, and then to the other leg; finally, it may affect the chin, lips, and tongue, muscles, and the muscles of the neck.

The intensity of the tremor varies. It is increased by excitement, when the patient is tired, etc.; often it can be increased and made evident in one hand by energetic voluntary movement in the other.

The tremor persists when the body is at rest, but it ceases during sleep. By voluntary movement it may be suppressed, at least temporarily, for a long period at the beginning of the disease; so that the patient is able to use his hands in eating, writing, dressing, etc., and especially for coarse work. In the late stage this may not be possible.

The second important symptom is the muscular rigidity or tension. All the muscles of the body are in a condition of slight tonus, of increased tension. This is easily detected by the peculiar difficulty of rapidly and freely bringing the muscles into action. A short delay in commencing the movements may be observed. This condition of the muscles causes the characteristic external appearance of the patient, as regards attitude, expression, and movements. The immobility of the facial muscles causes the grave, sorrowful facial expression; that of the muscles of the arms

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and hands causes the slight flexion at the elbows, the "writing position" of the hand; that of the trunk muscles causes the bent attitude, the difficulty in getting up from the chair, in turning quickly, and in turning in bed; the rigidity of the leg muscles causes the peculiar stiff, spastic gait, the scraping of the floor, and the slightly bent knee. The combination of these deformities gives rise to the peculiar attitudes. The difficulty in rapidly accommodating the body to changes in the position of the centre of gravity causes the peculiarities of gait known as propulsion and retropulsion.

Often vaso-motor disturbances are present, redness and heat in the face, heat and burning in the skin, with increased sweat excretion; sometimes a feeling of coldness in the skin, and constantly a feeling of tiredness in the muscles. A prominent symptom is a feeling of general restlessness in the limbs and the necessity of frequently changing the position. This symptom and the muscular rigidity cause great discomfort to the patient in the later stages of the disease. The patient is obliged to change position every fifteen or thirty minutes, and requires assistance on each occasion; and he is obliged to be turned over in bed many times during the night.

The two typical symptoms, tremor and rigidity, are not always developed equally. The rigidity, though varying in degree, is apparently a constant symptom, but the tremor may be completely absent; it may not be observed for years, and even in a well-developed case it may be only slight and temporary, so that long and careful observation may be necessary in order to detect it. These are the cases of paralysis agitans without tremor, and they have caused numerous mistakes in diagnosis: only the rigidity is present, and at first only on one side. The patient experiences a weakness, a helplessness, or tired feeling, in one arm; he drags the leg on the same side, and complains of various nervous troubles. Erb states that a number of cases of this kind have been sent to him with all kinds of diagnoses. Often the first glance has revealed the nature of the disease; often, however, only long observation of the patient and the course of the disease have shown its true character, and the diagnosis of paralysis agitans has been confirmed by the late occurrence of tremor and the non-development of the symptoms of other diseases. In such obscure cases, especially when the peculiar position of the hand and arm, the facial expression, the attitude, and the gait of paralysis agitans are present, Erb advises the practitioner to remember this form of the disease—paralysis agitans without tremor.

As regards etiology, Erb points out that the disease is one occurring in the later period of life; that the majority of cases commence after the age of fifty, though occasionally it begins in the fifth, fourth, or third decennium. He mentions two cases beginning at the age of thirty-six

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and two at the age of forty. Lannois has described a case beginning at the age of twelve, but these early cases are quite the exception. Erb thinks that sex has no influence in the etiology, but cases are met with in which heredity can be traced. He mentions a family in which three or four sisters suffered from the disease. Syphilis is not an etiological factor, as is shown by the occurrence of the disease in the later period of life, and by the occurrence of the disease with equal frequency in both sexes. Moreover, statistics show that a previous history of syphilis is not more frequent in paralysis agitans, but rather less frequent, than in males generally.

Alcoholism, also, has no influence. The influence of cold, damp residences and infectious diseases is not proved; but psychical conditions, great mental emotions, sorrow, and especially "psychical trauma," fright, anxiety, and perhaps also physical trauma, appear to have a decided influence in causing the disease.

As regards the seat of the lesion in paralysis agitans nothing definite is known. Evidently it is somewhere in the motor apparatus from the cerebral cortex to the muscles.

The muscles themselves, the peripheral nerves, and the spinal cord may be excluded. We know of no spinal cord disease in which tremor like that of paralysis agitans occurs. Everything in the clinical history points to the brain as the seat of the lesion, especially the fact that—in rare cases—a post-hemiplegic paralysis agitans may occur (analogous to post-hemiplegic athetosis and chorea); and the occasional presence of a local organic brain affection (tumour) on post-mortem examination in cases of unilateral paralysis agitans is suggestive. The unilateral onset and the analogy of the group of symptoms with those of ordinary hemiplegia from lesion of the internal capsule and basal ganglia are also suggestive. In hemiplegia the paralysis and contracture with the increase of the tendon reflexes is most marked in the arm, less marked in the leg, and least in the face. In paralysis agitans the tremor, the rigidity of the muscles, and the increased tendon reflexes are distributed with the same intensity in the parts just mentioned; also the position of the limbs and gait on the side first affected remind one of hemiplegia.

Whether the lesion is in the region of the cerebral ganglia, in the corona radiata, or in the cerebral cortex is difficult to decide. Pathological examinations have shown that coarse lesions in the cerebral peduncles near the motor tracts can produce the symptoms. At the commencement of the disease a marked lesion in the motor apparatus cannot be present, since there is no loss of power.

Pathological anatomy has not revealed any characteristic changes. Formerly only negative results have been recorded; but more recently pathological changes have been described in the spinal cord by a number of

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observers (see MEDICAL CHRONICLE, Vol. I., N.S., 1894); and some authors believe these to be the cause of the disease. But the negative results obtained by others (Oppenheim, Fürstner, etc.) in undoubted cases of the disease furnish strong evidence against this view. The changes which have been recorded in the spinal cord, brain, peripheral nerves and muscles consist of thickening of the vessels, increase of connective tissue, diffuse and insular neuroglia proliferation, and atrophic and degenerative changes in the ganglion cells and nerve fibres.

Almost all authors agree in regarding these changes as identical in nature with senile changes; they differ only in intensity and in special localisation in paralysis agitans. The disease has, therefore, been regarded as one that is caused by unusually intense and premature senile changes in the nervous system. Against this view Erb points out that the same marked senile changes can occur in old people without any symptoms of paralysis agitans being observed; also, one would expect paralysis agitans to be very much more frequent in old persons if these changes were the cause of the disease. Further, senile tremor differs from that of paralysis agitans.

Erb thinks that a point of special importance is the fact that the changes have no characteristic localisation, but are distributed irregularly over the whole central nervous system; and this fact is very significant when one remembers that the symptoms are entirely limited to the motor system.

Hence, he thinks we must conclude that at present no certain and constant pathological change has been found in paralysis agitans.

The disease is progressive and the prognosis unfavourable, though the course may be very long. Temporary arrest and improvement may occur, and the disease may only end fatally after many years. In the cases of apparent recovery, probably the diagnosis has not been correct; still, it is not quite impossible that recovery may occur.

As regards treatment, Erb points out how numerous have been the remedies and how few have been shown to be of real value. He describes in detail a method which he has found of service in numerous cases. In the first place, the diet and mode of life of the patient must be regulated. He advocates a simple, nutritious, mixed diet, moderation in eating and drinking, very little spirits, coffee, or tea, the avoidance of all mental excitement and fatigue; moderate exercise in the open air.

Of internal medicines he recommends arsenic internally. The use of electricity in the form of the faradic bipolar bath he has undoubtedly seen of frequent service. The author has usually had recourse to mild hydropathic treatment, especially in combination with forest and mountain air. Hot baths he has found to have bad effects. Of great importance is the symptomatic treatment—the diminution of

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the tremor and muscular rigidity. For this purpose we possess drugs which in most cases give satisfactory, often brilliant, results. Erb considers that the most useful is hydrobromate of hyoscine (Merck's), but a preparation as fresh and reliable as possible is to be employed. In very small doses, given hypodermically, it diminishes the tremor, the restlessness, and stiffness for some hours, and makes the life of the patient tolerable, and enables him to follow his employment. Erb states that he has seen the most severe tremor arrested by this drug. For many years he has used it without any bad effect. A slight increase of the dose is sometimes necessary. He has seldom seen any unpleasant effects of the drug, and he fails to understand Mendel's statement that he has seen alarming intoxication symptoms after minimal doses. Such symptoms Erb has never observed. The drug has seldom proved useless, and seldom has any patient been unable to continue it. He recommends very small doses hypodermically, from two to four decimilligrammes once or twice daily, and therefore caution in the administration is necessary. Often it is useful to inject the full doses in the forenoon and half the dose in the evening. The patients have then less tremor during the day and sleep well at night. The hyoscine can also be given internally in pill form with good effect, but then a somewhat higher dose is required. [The British Pharmacopœia gives the dose as $\frac{1}{200}$ — $\frac{1}{100}$ of a grain, which we suppose to be that for internal administration by the mouth.]

Duboisin, which has been recommended by Mendel, has a similar action. It may be given in doses of two to three decimilligrammes two or three times daily. Observations which Erb has made, have convinced him that it acts on the tremor and rigidity in the same manner as hyoscine, but somewhat larger doses are necessary. Duboisin acts better than hyoscine in some patients, in others hyoscine is more useful. These two drugs Erb considers to be the best palliative agents in paralysis agitans. Little can be said in favour of other palliatives, bromides, atropine, hyoscyamin, ergotin, valerian, strychnine, cannabis indica, etc.

The favourable influence of railway journeys on some patients caused Charcot to suggest the use of a kind of vibrating chair, which has occasionally been of some service. *R. T. Williamson.*

Teichmüller (W.). "On the occurrence and significance of eosinophile cells in tuberculous sputum."—*Centralblatt für Innere Medicin*, April 2, 1898.

It is generally believed that eosinophile cells occur only very rarely in the sputum of phthisical patients. The author examined the sputum of 153 patients, and found them in 111 of these. Their presence depends

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on the general condition of the patient and the stage of phthisis, and allows certain conclusions as to the prognosis, for it shows the efforts of the organism to ward off the infection. In the initial stage of phthisis, before any tubercle bacilli are found, they are present; with the appearance of the tubercle the eosinophile cells become less numerous, and may soon disappear altogether. Should the patient improve, and the tubercle bacilli diminish in number, then eosinophile cells reappear. He noticed an increase of these cells whenever the patient improved, as, for instance, after a residence of some weeks' duration in the country; and they quickly disappeared with the onset of acute symptoms, as in galloping consumption. In the 42 cases in which the cells were missed, several unfavourable conditions, such as hereditary taint, an advanced stage of the disease, high temperature, and other unfavourable complications were present. According to the author, the examination of the sputum for eosinophile cells gives us an objective measure of the powers of resistance of the patient, and is of use in considering the prognosis of the case, and also the benefit derived from any special treatment.

J. Dreschfeld.

EMDEN (VAN). "Clinical investigations on the blood-plates" (from the University-Clinic of Professor Nolen at Leyden).—*Fortschritte der Med.*, 1898, Nos. 7 and 8.

THE number of blood-plates present in the blood in different diseases has as yet been little investigated. In the normal blood Hayem found 255,000, Afanasiew 200,000 to 300,000, Fusari 180,000 to 250,000 blood-plates in one cubic millimetre of blood.

Hayem discovered that after an acute loss of blood, and after the crisis of several infectious diseases, there always is a great increase in the number of blood-plates (crise hématoblastique), followed by a diminution of the same. Investigations, to be of any value, must, therefore, be made in series.

The agglutinative properties of blood-plates make their counting a matter of difficulty. Van Emden gives the different methods adopted by former investigators, and recommends the following procedure:—A drop of blood is obtained by a deep prick from the lateral surface of a finger previously cleaned with alcohol and ether. The capillary tube of the mixer, also previously cleaned and dried with alcohol and ether, is quickly filled up to mark 3 or 4 with blood, and then quickly up to 10 (or both approximately so) with the following fluid (Prus's solution), kept ready in a small glass:—

Sol. acid. chromic, 0·1 per cent.....	10·0
Sol. acid. osmic, 1 per cent	10 0
Acid. acet. glacial	1 0

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The mixer is then held between two fingers, and thoroughly but not violently shaken for five minutes. It is advisable to have the mixer, previous to filling it, cooled in a tube placed into a freezing mixture.

The blood-plates can then be counted with the hæmocytometer in the usual manner. They appear as roundish, elliptical, opaque bodies with a diameter of 2 to 4 μ, some measuring as much as 6 to 7 μ, and the smallest 1·5 μ only.

It is important not to shake too hard, as otherwise a number of small irregular refracting bodies appear—the remains of partly destroyed blood-corpuscles.

The average number of blood-plates found by van Emden in healthy human blood was 245,000 per cubic millimetre.

The number of blood-plates is increased in cachexia, chronic anæmia (Hayem and Cadet), pneumonia (Halla), septicæmia, tuberculosis, aortic disease, and during gravidity (van Emden). The number of blood plates is diminished in typhoid fever (Afanasiew), erysipelas, pneumonia with high fever, scurvy, purpura hæmorrhagica, mitral disease, emphysema, asthma, pernicious anæmia, and sub finem vitæ (van Emden).

Slawyk. "On an eruption of the mucous membrane, first described by Koplik, as an early symptom of measles."—*Deutsche med. Wochenschr.*, 1898, No. 17.

Koplik, of New York, described in the *Archives of Pediatrics*, of December, 1896, an eruption of the mucous membrane occuring in the premonitory stage of measles. The eruption is localised on the mucous membrane of the cheeks, and consists in shining red spots, which in their centres have very small bluish white efflorescences. Slawyk confirms the observations of Koplik, and draws attention to their great importance, as they enable the diagnosis of measles to be made at a very early stage, days before the general rash has appeared.

At Professor Heubner's clinic for children, at the Berlin Charité Hospital, Slawyk found "Koplik's spots" 45 times in 52 cases of measles, and in another epidemic 31 times in 32 cases. Slawyk describes the spots as bluish white, slightly elevated, roundish, measuring ·2 to ·6mm., surrounded by a red lentiform margin. They occur mostly on the buccal mucous membrane, occasionally also on the lips, and they were once seen on the tongue. They number usually from 6 to 20 on each side, but they are occasionally more numerous, and they sometimes occur on one side only—a good illumination is necessary to make them visible.

The spots scarcely ever coalesce, and the rash can easily be differentiated from other affections of the mucous membrane. It

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somewhat resembles thrush, but is distinguished from this by the colour and the roundish shape of the eruption. They cannot be wiped off, but the whitish spots can be removed with forceps without giving rise to pain or bleeding. Microscopically examined, they consist of thick layers of buccal epithelium, partly fatty degenerated. Fibrin or any characteristic micro-organisms could not be found, though the examination in this respect was not exhaustive.

Koplik's spots were seen in measles only; they were absent in nine case of rubeola. In every case where they were observed they were followed by the characteristic morbillar eruption, so that now at the Berlin clinic any child showing these spots is at once transferred to the measles ward. They usually make their first appearance on the first or second day of the premonitory stage, they then increase in number for 3 or 4 days, and then disappear. Their abundance or rarity does not prognosticate the severity of the coming attack of measles, and they require no special treatment, but they are of great diagnostic value.

CORNET. "On the infectiousness of dry tubercular sputum." (Report of a paper read at the Berlin Medical Society).—*Berl. klin. Woch.*, p. 317, 1898.

FLÜGGE published a few months ago in the *Deutsche med. Woch.* a paper in which he said that the inhalation of dry tubercular sputum was innocuous, as the dust forming from it was not of sufficient fineness to penetrate into the depths of the lung tissue. He based his propositions on experiments, in which he had failed to make animals tuberculous by the inhalation of such dust. Experiments with similar negative results had been made by Sirena, Pernice, de Toma, Celli, Guarnieri, and others, and Cornet himself had obtained similar results in some of his former experiments.

Cornet therefore thought it necessary to repeat these experiments under conditions approximated as closely as possible to those under which dust gets naturally inhaled. He did this at the Kaiserl. Gesundheitsamt. A room was set aside for the experiment, its floor covered by an old carpet. The expectoration of a patient suffering from chronic phthisis was collected between 7 and 11 a.m.; it was then mixed with the dust swept from the carpet. Part of this mixture was spread on the carpet and allowed to dry for two days. Another part was dried, pulverised in a mortar, and kept in a bottle. Six guinea-pigs were made to inhale this dust, sprayed out by means of bellows, through the nose, six others through the open mouth. These, as well as 36 more guinea-pigs, were placed in open cages at different heights in the room. The carpet of the room was then swept with a sharp brush, so that clouds of

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dust arose, at four different occasions. After a time (Cornet does not state the length) the animals were killed, and 47 out of the total of 48 guinea-pigs were found in a state of advanced tuberculosis of the lungs and bronchial glands.

The immense virulence of the dry tubercular sputum and dust was further proved by the following fact: Cornet in making this experiment sought to protect himself as much as possible against the great dangers which the mode of procedure doubtless entailed upon himself. He therefore wore during the four sweeping processes, which he himself executed, a long coat reaching down to his feet, over head and face a cloth with only two narrow openings for the eyes. These openings were further protected by gauze, allowing him to look through; further, he wore his spectacles, and over nose and mouth a thin layer of cotton wool. To see whether this protection was sufficient he inoculated after the experiment some of his nasal mucus into the left inguinal region of a guinea-pig, and this animal was found affected with tuberculosis of the left inguinal glands and of the spleen.

Cornet explains the failure of previous experiments by the fact that the animals were kept in closed boxes in which the moisture from the expired air, perspiration, etc., soon converted the extremely hygroscopic dry dust into particles too large to be taken up by the inspiratory air-current. *S. Moritz.*

KAREWSKI. "Actinomycosis of the lung and thorax."—*Berlin. klin. Wochenschrift*, 1898, Nos. 15, 16, and 17.

SINCE I. Israel and Ponfick's publications actinomycosis in man, originally considered a rare disease, has been found in all parts of the world with varying frequency. Many cases have been reported from all countries since Israel, in 1885, collected 38 cases. Schlange alone reported, in 1892, on 120 cases observed during ten years at the Berlin clinic; Karewski sees annually about 15 cases at the Berlin Jewish Hospital.

The lungs are comparatively rarely affected by the parasite. But all recorded cases of actinomycosis of the lung, with the exception of two published by Schlange and a third by Jakowski, have ended fatally. Karewski is able to add a fourth case, in which he effected a cure by an extensive operation, described below.

Actinomycosis, where affecting the lung, causes an extraordinarily malignant and progressive destruction of its parenchyma. Three stages may be distinguished in this destructive process. In the first stage peribronchial and pneumonic foci form, which undergo necrotic

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softening and produce smaller and larger cavities; in the periphery of the latter a reactive inflammation and new formation of connective tissue take place, which lead to induration and retraction of the lung tissue. The first symptoms of this stage are those of chronic bronchial catarrh, and are so slightly marked that they do not lead to a diagnosis unless the characteristic parasite is accidentally found in the sputum. After a time, when a larger portion of the lung has become indurated, auscultatory and percussory signs appear. The apices of the lungs usually remain free, whilst the subclavicular and postero-lateral regions are more frequently affected, though sometimes the apices may be the primary seat of the disease, which then closely resembles bacillary phthisis.

More prominent are the symptoms of the second stage of actinomycosis of the lung. The continuous propagation of the parasite has reached to the surface of the lung and affects now its serous covering, adhesive pleurisy or acute pleuritic effusions form, or more usually both exudations and adhesions occur at the same time, the destruction and induration of the lung tissue progressing simultaneously. Undermining granular shoots, so characteristic of actinomycosis, grow outwards into the thoracic wall, downwards into the diaphragm and into the liver, and give rise to peritonitis, or the mediastinum or the pericardium become infected.

Clinically this stage is distinguished by the physical symptoms corresponding to the affection of the lung, pleuræ, and adjoining organs, by febrile temperature, and by pain; but of the greatest diagnostic value are two symptoms—the swelling of the thoracic wall, where this has been affected by the parasitic fungus, and the peculiar character of the fluid which is obtained by aspiration, which is usually performed under the impression that a perforating empyema is present. The swelling, which at first shows itself as an œdematous redness or a flat prominence, gradually becomes higher and broader; originally extremely dense and hard, it becomes softer in single parts, and may even give rise to slight fluctuation, without the formation of much pus. On aspiration, therefore, only rarely fluid may be obtained, though sometimes a drop of muco-purulent fluid thus got may, on microscopic examination, show the characteristic parasite. On penetrating deeper with the exploratory needle one passes through hard infiltrations and dense deposits, and finally one gets, on aspiration, either no fluid or, in the place of the expected pus, a serous or sanguino-serous exudation, showing that there is no perforating empyema. From the latter the disease is also distinguished by its slow course, extending over months, and by the dense elastic infiltration of the thoracic integument, which resembles a tumour so much that sarcoma is frequently diagnosed.

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The sputum of the patient frequently shows nothing characteristic, as the parasite is not often found in it; it is muco-purulent, may contain some blood and be rusty, or may be free from hæmorrhage; it contains no elastic fibres.

The third stage of actinomycosis develops from the preceding, through the exulceration of the swelling at single places, the formation of fistulæ, the extension of the disease to all the adjoining organs, and the fearful destructions thus caused internally and on the surface. The parasite creeps continually forwards, burrows mostly along connective tissue tracts, and may thus, or through metastasis, appear at distant places. Death finally takes place, after months or years of suffering, either through exhaustion, after the formation of numerous fistulous openings, or through the direct affection of important organs, or through amyloid degeneration, or with the symptoms of pyæmia.

The three stages of actinomycosis of the lung may, therefore, be distinguished into (1) a latent stage, in which the parasite affects the lung tissue; (2) a florid stage, in which the parasitic growth perforates to the surface of the lung and affects the thoracic wall; and (3) a chronic stage, in which external perforation, formation of fistulæ and affection of adjoining organs by continuation and metastasis take place. Only during the first two stages therapeutic measures can be expected to offer hopes of success.

Karewski's case had well advanced into the second stage. It was that of a lawyer's clerk, who had not come into special contact with cattle or grain. The right axillary region showed a large tumour, of an oval form, covered by inflamed skin. Commencing about two inches to the right of the sternum, it reached to the posterior axillary line, and extended from the axilla to the lower margin of the sixth rib; its thickness appeared to be about 1½ inch. The tumour was painful on pressure, dense, and elastic; in some places it showed fluctuation. The immediate neighbourhood of the tumour felt hard. The whole right side of the thorax, apart from the tumour, appeared much retracted and shrunk, and respiratory movements of this side were almost abolished. Percussion gave slight dulness over right supra- and infra- clavicular regions, complete dulness from the third rib downwards. On auscultation the respiratory sounds were much diminished and replaced by fine râles, crepitation, and friction sounds. The sputum was mucopurulent, and contained nothing characteristic. An exploratory aspiration gave fluid containing actinomyces.

Five months had elapsed since the first onset of symptoms, severe pain, cough, etc., and though the case was undoubtedly far advanced, Karewski performed an operation, in which he firstly excised the affected skin, fasciæ, and muscles down to the ribs. As the granula-

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tions extended underneath the skin and covered the whole anterior surface of the thorax from the third to the eighth rib, all this was removed, including the pectorales muscles up to the second rib above and the sternal margin to the left, together with part of the anterior serratus and latissimus dorsi muscles. In the sixth intercostal space was a fistula, through which the parasite had crept to the surface. The sixth rib, from the axillary line to the surface, was now resected. It was then found that the whole anterior part of the thorax was converted into a cavity, containing actinomycotic granulations and pus. The seventh, fifth, fourth, and third rib were therefore resected in addition, and the whole diseased part laid bare. The surface was well scraped, and all the diseased parts removed. Two tracts were found to extend deeper into the lung tissue; these were also scraped out, and they, as well as the adjoining affected lung tissue, were burned away with Paquelin's cautery. The cavity, larger than a fist, was filled with iodoform gauze, and the patient made a good recovery. No further actinomyces could be found in the granulations and wound secretions. Iodide of potassium was administered, and after two months the cavity had much diminished in size; only a fistulous, funnel-shaped opening remained in the axilla leading into a larger bronchus. The patient had gained 16 lbs. in weight, and was able to resume his work.

Karewski draws from this and the only other three cases of actinomycosis of the lung who recovered, the conclusion that only a radical operative removal of all the diseased tissue, taking care always to operate within healthy tissue, can give hopes for successful results, partial removals having only led to speedy disaster. With the signs above given a diagnosis should be arrived at as soon as a swelling of the thoracic integument forms. The occurrence of this swelling, together with the lung symptoms, ought to lead to aspiratory exploration, and both the presence of pus without parasites or the parasite without pus would give an indication for free incision. Should, then, the characteristic gold-yellow granulations, the remains of old hæmorrhages in the midst of hard infiltrations, and the small fungoid growths, show the presence of actinomycosis, then all diseased parts must be removed. It is then often found that extensive changes in the thoracic wall are accompanied only by comparatively small foci in the lungs, and that the operation may thus be completed. In view of the absolutely fatal course of the disease, unless all the affected tissues are removed, the most extensive operations are justifiable.

Siegmund Moritz.

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HARE (H. A.). "The frequency of exophthalmic goître and its frequency in the sexes."—*International Medical Magazine*, April, 1898. Vol. VII., No. 4, p. 249.

THE author finds from an examination of 10,603 cases at the Jefferson Medical College Hospital, 11 cases of exophthalmic goître, or 1 in 964. In the University of Pennsylvania Hospital, out of 35,076 cases, there were 48, or 1 in 751.

Murray states that out of 400 cases of this disease 43 were males and 357 females, or a proportion of 1 to 8·3. Of Eshner's collected 227 cases, 42 were males.

Among a total of 1,839 collected cases, 286 were males and 1,553 females, or a proportion of about 1 to 6.

ESHNER (A. A.). "A contribution to the statistics of exophthalmic goître."—*International Medical Magazine*, April, 1898. Vol. VII., No. 4, p. 251.

AFTER analysing a large number of cases, the author arrives at the following conclusions: That exophthalmic goître occurs approximately 4·5 times as often in females as in males; that the disease is most common during the period of active adult life, occurring earlier in females than in males; that the disease is uncommon, if not rare, in the black race.

BINNIE (J. F.). "Contribution to the study of appendicitis obliterans." —*Annals of Surgery*, May, 1898, pp. 618—625.

THE author, after a microscopical examination of a number of appendices, arrives at the following conclusions:—

(1) There are at least four distinct varieties of appendicitis obliterans: (*a*) An exudative variety; (*b*) a variety characterised by mucosal hyperplasia and sclerosis; (*c*) a variety characterised by submucous and muscular hypertrophy; (*d*) a reparative variety.

(2) In all varieties there may be and generally is localised peritonitis.

(3) Endarteritis and peri-arteritis are almost constant phenomena of the disease.

(4) The vermiform appendix in health is distinctly muscular; in disease the muscle is often hypertrophied.

GREENE (R. H.). "Syphilis of the kidneys."—*Journal of Cutaneous and Genito-Urinary Diseases*, January, 1898, pp. 12—19.

THE author reviews the subject of renal syphilis under the heads of—(1) parenchymatous nephritis; (2) interstitial nephritis; (3) gummatous

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nephritis; (4) amyloid nephritis, and arrives at the following conclusions:—

(1) In a small proportion of cases syphilis attacks, directly or indirectly, the kidneys, and causes inflammation of the parenchyma and interstitial tissue, or gives rise to gumma and amyloid degeneration.

(2) Any one of these conditions is seldom present alone without being associated with one or more of the others.

(3) Syphilis shows in the various lesions of the kidney caused by it, except in interstitial inflammation, and even here occasionally, a proneness to attack one kidney only.

(4) Occasionally syphilis of the kidney causes symptoms which simulate malignant disease or renal calculi. *T. N. Kelynack.*

Finny (J. M.). "On a case of recurrent idiopathic pneumothorax, without effusion, ending in recovery."—*Dublin Journal of Medical Science*, April 1, 1898.

The patient, a stableman, aged 18, apparently quite healthy, was, while going to work, suddenly seized with violent pain in the chest. He returned home and went to bed. On admission to the hospital three days later, the left pleural cavity was found to be so full of air that the heart was pushed over to the right side. His respiration was easy (28); pulse, 96—100; temperature, 98°; and he felt quite comfortable. There was at no time any effusion into the cavity. The air was gradually absorbed, and the patient left hospital in about five weeks, having gained half a stone in weight. A fortnight later he exerted himself in using a manure fork, and next morning his symptoms returned. When readmitted, the physical signs were the same as in the first attack, the heart again being pushed over to the right. He progressed favourably, but when last seen, nearly three months after the onset of the relapse, there appeared to be still some air in the upper part of the pleural cavity.

The patient apparently did not suffer from phthisis. The author discusses the physical signs found in the case, and refers to other cases of pneumothorax without effusion, and sums up as follows:—

(1) That simple or idiopathic pneumothorax is a very rare disease of the lungs and pleura.

(2) That a repetition of the disease in the same lung is of still greater rarity.

(3) That in a very small number of cases the entrance of air into the pleura—to stretch it to its utmost limits—does occur without any effusion of fluid; and this even may happen a second time in the same lung.

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(4) That the absence of fluid renders the disease less fatal than when air and fluid are effused.

(5) That the presence of air in the pleura may occur without any febrile or constitutional disturbance.

(6) That in the face of such possibilities we should be cautious as to giving too grave a prognosis when evidences of a ruptured lung and pleura are present, and particularly so when there is no previous disease.

(7) That the tendency of such cases is towards spontaneous recovery, and, in the absence of urgent symptoms calling for relief, it is wiser not to employ surgical means to let off the effused air.

Alan McDougall.

Surgery.

UNDER THE CHARGE OF THOMAS JONES, M.B., B.S., F.R.C.S.

LLOYD (JORDAN). "On infantile sterno-mastoid tumours and the simple wry-neck of children."—*Birmingham Medical Review*, May, 1898.

THE author speaks of the simple wry-neck of children as a preventable deformity, because he is convinced that such cases ought not to occur. The affection is painless, insidious, progressive, and usually long overlooked; as a rule the patients do not come under the observation of a surgeon until they are from seven to eleven years of age. Parental statements as to the duration of the deformity are almost always unreliable. The relation of wry-neck to the swellings met with in the sterno-mastoid muscles of infancy is important. These swellings were formerly regarded as gummata, but the theory of their syphilitic origin offers no explanation of the fact that these so-called muscular gummata are seen only in the sterno-mastoids, and more often on the right side than the left. Many children suffering from sterno-mastoid tumours and also many with wry-neck have been born in the breech position, and it is pointed out that during delivery of the after-coming head the chief strain of the extracting force is usually borne by the right sterno-mastoid muscle. The author further points out that in head presentations, in the usual left occipito-anterior position, the left sterno-mastoid muscle bears the bulk of the strain, and is therefore more liable to be damaged.

Sterno-mastoid Tumour of Infancy.—The swelling is not present at birth, but usually appears from two to three weeks later. It varies in size from a horse-bean to an adult thumb. It is elongated in the course of the muscle. The overlying skin is normal. From a few recorded

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instances of histological investigation, the swelling has been shown to be composed of reparative material in the course of organisation. Treatment is simple and satisfactory, but must be continued for a considerable period. The affected muscle must be prevented from repairing in the shortened condition.

Common wry-neck in children is, therefore, traumatic in origin, and results from injury to the sterno-mastoid during birth. Out of twenty-six cases, which are tabulated by the author, seventeen came under observation between the ages of seven and eleven years. In nearly all "something wrong with the neck" had been noticed for a long time; in several from earliest infancy. Fifteen were males and eleven females, a difference due to the larger size of male children at birth, and their greater liability, therefore, to injury during delivery. In sixteen the right side, and in ten the left side, was affected. Secondary phenomena are very likely to come on in these cases, the most important being scoliosis. In old-standing cases the other tissues of the same side of the neck are also affected—the deeper muscles, the fasciæ, the spinal ligaments, and the vertebræ themselves. Once established, little can be done for the relief of the deformity, except by division of the sterno-mastoid muscle. For this purpose the open operation is strongly advocated. Not infrequently the deep fascia, and occasionally the posterior belly of the omo-hyoid muscle, also require division. Immediately after the operation the head should be fixed in the best possible position.

The paper concludes by a detailed account of some of the cases which presented special features.

COLEY (WILLIAM B.). "The management of hernia in infancy and childhood."—*Archives of Pediatrics*, April, 1898.

THE author states that not infrequently he has seen cases of hydrocele of the cord which have been mistaken for hernia.

Treatment should be begun as soon as the rupture is discovered; it should not be delayed, as is recommended by some writers. The best truss is a well-tempered steel spring, as light as is consistent with the support required, covered with rubber tubing, with a pad of polished wood, or of wood covered with chamois leather. The truss should be applied much more loosely than in adults; it should be worn day and night. The question as to the length of time that the wearing of the truss should be continued is not easy to answer. The author's rule is to continue the use of the truss until at least two years have elapsed since the rupture was last down.

Results of Mechanical Treatment.—In order to give a satisfactory answer to this question, the author has analysed 26,388 cases of hernia

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which have been treated at the Hospital for Ruptured and Crippled, New York, and has come to the conclusion that from 25 to 30 per cent of children are not cured by trusses. The younger the patient, the better are the prospects of cure.

Indications for Operation.—Operation should not be advised until a truss has been satisfactorily tried for a reasonable time—one to two years—without benefit. The following, however, are exceptions to this rule :—(1) In femoral hernia operation may at once be advised, since the chances of cure by truss are slight ; (2) when irreducible or adherent omentum is present ; (3) in some cases, especially in dispensary practice, the rupture cannot be satisfactorily retained on account of insufficient care on the part of the parents ; such cases may with advantage be subjected to immediate operation.

Method of Operating.—Bassini's operation gives by far the best results.

Dangers.—These are chiefly due to the anæsthetic, although peritonitis from wound infection has proved fatal in a number of cases.

Strangulated Hernia in Infants.—The author gives an account of seven cases in which he has operated for this condition. Of these, six recovered, and one, which was almost moribund at the time of operation, died. In four of the cases the cæcum, and in three the appendix in addition to the cæcum, was present in the sac. Reference is made to the cases of strangulated hernia in children, which have been collected and published by Tariel, of Paris, and Marsh, of London.

Dowd (Charles N.). "Strangulated hernia in infants under one year of age, with the report of a second case successfully treated by operation."—*Archives of Pediatrics*, April, 1898.

The author refers to a case which he published about twelve months ago, and in which he operated successfully for a strangulated hernia in an infant of four months. The present case was a male child, six months old, with strangulated right congenital hernia. Strangulation had existed for twenty-one hours. The sac contained four inches of the lower end of the ileum. The operation was completed after the method of Bassini.

He has also brought together accounts of one hundred similar cases in infants under one year of age, all of which were subjected to operation. Of these thirty-one were collected by Stern, 26 by Tariel, 10 by Knoblock, and 33 by the author. There were 20 deaths, a percentage corresponding very closely with the mortality of 18·9 per cent which Stern found in 733 adults operated upon under similar conditions. Death after operation in these cases is almost invariably due to delay. The fear

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that the patients will not survive the operation has often been given as an excuse for delay; but, as a matter of fact, infants bear operations of moderate severity very well indeed.

Bangs (L. Bolton). "Catheter life, and some remarks on the etiology of hypertrophy of the prostate gland."—*Medical News*, February 12th, 1898.

Reference is first made to the remarks of Sir Henry Thompson concerning the frequency of enlargement of the prostate: (1) Prostatic enlargement of moderate degree occurs in one out of every three males who reach middle life. (2) Twenty per cent of all men have fibrous tumours of the prostate previous to the fiftieth year of life. (3) After the age of fifty years one man in every eight has marked enlargement of the gland. (4) The disease rarely begins after seventy-five years of age.

The author considers that the frequency of these affections cannot be explained by attempting to discover an analogy between pathological conditions of the prostate and fibroid degenerations of the uterus. He refers to the fact that, whilst prostatic troubles occur after middle life, the great majority of women, after forty-five years of age, enjoy a condition of comfort. In most cases of enlarged prostate the disease begins and remains in the glandular tissue, the other structures becoming involved secondarily. This explains the diminution in size of the gland which sometimes occurs after removal of the testes. From these considerations he thinks he is warranted in the statement that the first steps in enlargement of the prostate take place in youth. Admitting that gout, rheumatism, and general atherosis may account for some cases, he claims that the chronic irritation and hyperæmia, which result from excessive sexual excitement, often commencing in early life and maintained during the vigorous period of existence, are sufficient to account for the largest proportion of the cases. He believes that a certain degree of hypertrophy is present in many men long before it is suspected.

The first evidence of the existence of prostatic enlargement is a sense of irritation at or about the neck of the bladder, accompanied by some variation from the normal sexual condition. Frequently there is a sensation of fulness in the perineum, and as time goes on increased frequency of micturition and tardiness in starting the urine are noticed. Pain in the sacral and lumbar regions, which is usually regarded as "rheumatism," is often present. In diagnosing these cases, stricture of the urethra must first be excluded; the passage of a catheter will usually reveal the presence of a varying amount of

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residual urine, and examination by the rectum will probably indicate a certain degree of enlargement of the gland. The author points out that the first introduction of a catheter into the bladder of a patient presenting the above symptoms should be regarded as a surgical operation, and must be conducted with the most scrupulous attention to surgical details. A soft rubber instrument with a solid tip should first be tried; if this fails, a *coudé* or *bi-coudé* catheter, and lastly a silver catheter with a prostatic curve.

Cases of prostatic trouble may be broadly grouped into those in which there is more or less power of micturition and those in which there is complete retention. In the latter cases it is especially important when introducing the instrument to avoid minute traumatisms of the prostatic urethra. The suffering caused by the passage of the instrument may at first be very severe, but may be modified by the use of eucaine solution. Twenty or thirty minims of a four to eight per cent solution should be injected. Eucaine is slower in its action than cocaine, and from six to eight minutes should be allowed for its absorption. The congestion of the prostate may be reduced by hot antiseptic irrigation and by gentle massage of the gland. Subsequently a weak solution of nitrate of silver (1 in 5,000, gradually increased in strength) may be applied to the deep urethra. The question of prolonged drainage of the bladder should only be considered in the early stage of the disease in those cases where the bladder has become infected by septic material. When the introduction of the catheter has become painless the patient should be carefully instructed in the principles which govern the maintenance of a sterile bladder. When there is commencing decomposition of the urine, the author speaks highly of the administration of benzosol in doses of two or three grains every two hours. This drug is usually well borne, does not set free carbolic acid like salol, and in the intestine is transformed in guaiacol and benzoic acid. The introduction of solution of nitrate of silver (1 in 1,000) into the bladder sometimes checks commencing cystitis.

In cases where there is a certain degree of spontaneous urination, the use of a catheter must depend upon the amount of residual urine. If the residual urine is small in quantity, and if the bladder does not resent its presence, the use of the catheter is unnecessary; but if the urine changes in quality, and especially if there are obscure pains over the sacrum or in the pelvis, an instrument should be used. Where there is cystitis the bladder should be washed out sufficiently frequently to keep the patient comfortable.

Special attention should be paid to the disinfection of the catheter. The usual method of washing with soap and water after and before

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using, steeping the instrument in boiling water and then in the solution which is used for washing the bladder, has proved satisfactory in some respects, but not in all. The question of catheter-antisepsis has been solved by the application of formaldehyde. The author uses a Lilly's apparatus, which generates the gas from wood alcohol. Catheters and other instruments may be exposed to its influence for hours. He has also made some experiments with formalin (a solution of formaldehyde), and he found that three dirty catheters, all of which contained bacteria, were sterilised after fifteen minutes' immersion in a one per cent solution. Care must be taken that the solution comes in contact with the whole of the interior of the instrument.

FREUDENBERG (ALBERT). "Experiences with Bottini's galvano-caustic radical treatment of prostatic enlargement."—*New York Medical Journal*, February 12th, 1898.

THE reasons why this treatment, although advocated so long ago as 1875, has commanded little attention are, according to the author, three in number: (1) The difficulty in procuring the requisite instruments; (2) disinclination on the part of surgeons to operate without the direct guidance of the eye; and (3) the Guyon-Lannois theory of the origin of senile ischuria, which attributes the urinary troubles in question, not to the enlarged prostate, but to general arterio-sclerosis of the urinary tract and secondary weakness of the bladder.

The author has operated upon thirteen patients. Their ages ranged from 55 to 81 years. Eight had complete retention of from two months' to five years' standing. In the remaining five cases there was incomplete retention. All the operations were performed without chloroform, cocaine only being applied as a local anæsthetic.

Two cases died. In the first case the operation had probably little to do with the fatal result, but in the second case death occurred from embolic pneumonia, and was directly due to the treatment.

Placing aside these two cases, there were seven patients with complete retention, in all of whom the power of spontaneous micturition was restored by the operative treatment. The four remaining cases of incomplete retention were all greatly improved. Cystitis, when present before the operation, was either completely cured or considerably relieved. The general health of all the patients showed marked improvement. One of the patients, who had failed to receive the slightest benefit from removal of both testicles, was completely relieved by this treatment.

Drawings are given of certain modifications of Bottini's instruments which have been devised by the author.

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BECK (CARL). "A new operation for balanic hypospadias."—*New York Medical Journal*, January 29th, 1898.

INSTEAD of attempting to form a new urethra in these cases, the author dissects free the terminal part of the canal already present and brings it forward, so that the meatus occupies its proper position. A transverse incision is first made across the lower surface of the glans, passing behind the hypospadiac opening. The posterior border of the wound is drawn backwards and the urethra separated from the surrounding tissues. A strip of mucous membrane is then removed from the under surface of the glans. The urethra is drawn forward and its opening sutured to the anterior border of the freshened surface. Finally the under surface of the urethra is covered by suturing together the edges of the wound which was made across the under surface of the glans.

The author has performed this operation with success on two occasions. He gives four drawings illustrating the operative procedure.

LEWIS (H. EDWIN). "Mobility of the kidney."—*New York Medical Journal*, April 23rd, 1898.

THE writer of this paper concludes by the following statements:—

(1) Moveable kidney is a comparatively common condition, occurring more frequently in females than in males, the proportion being about twelve to one.

(2) Many causes may produce the condition; most cases result, not from one, but from several causes acting together.

(3) The condition is always a menace to health, liable as it is to distressing and dangerous complications.

(4) Non-operative treatment is never more than palliative.

(5) The operation of nephropexy by Reed or Senn's method promises permanent relief in the great majority of cases.

(6) Neprectomy should only be resorted to when all other measures have failed.

RUDIS-JICINSKY (J.). "Stab-wound of the heart: recovery."—*New York Medical Journal*, April 23rd, 1898.

THE writer's patient was a man, aged 26, who received a stab in the precordial region. The wound was clean-cut beneath the fifth rib, and was situated one-and-a-half inches from the middle of the sternum. It was three inches deep, and penetrated the lung, pericardium, and the apex of the heart. There was very marked collapse. Five days later empyema on the left side was diagnosed, and an incision was made in the eighth intercostal space; a large amount of breaking-

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down blood-clot was evacuated. The discharge continued to be very profuse for a long time, and three months had elapsed from the time of the accident before the man could be considered to be convalescent. Ultimately he made a good recovery.

Fischer, who collected 401 cases of wounds of the heart, found that recovery had taken place in 50 cases. Several cases have also been recorded where patients have survived for considerable periods with foreign bodies lodged in the heart.

Lendon (A. A.). "On foreign bodies in the bronchi, with notes of a case."—*Inter-colonial Medical Journal of Australasia*, March 20th, 1898.

The patient in the author's case was a boy, aged 7, and the foreign body which passed into the bronchus was an ebonite shirt-stud. It remained in the lung for a little more than two years, giving rise to symptoms which gradually increased in severity. When the lad was admitted to hospital there was profuse expectoration of pus, and it was evident that there was either abscess of the lung or empyema discharging through a bronchus. Exploration of the pleural cavity was undertaken, and some pus was evacuated. Shortly after the completion of the operation the stud was expectorated. The boy made a good and complete recovery.

The author gives a clear and concise account of the symptomatology, prognosis, diagnosis, and treatment of these cases. He also refers to the literature of the subject, and gives a table of twelve similar cases, all collected from Australian medical journals.

Nichols (C. B.). "A plea for operative treatment in certain fractures and dislocations."—*Philadelphia Medical Journal*, May 28th, 1898.

After referring at some length to the great injury to the soft parts which occurs in nearly all cases of simple fracture, the author states that operation should be resorted to in the following cases: (1) In all classes of fractures in which the bones cannot be easily placed in apposition and maintained there. (2) In all compound fractures. (3) In all old fractures where there is severe deformity, accompanied by severe pain or not. (4) In all old ununited fractures. (5) In all dislocations which resist reduction by manipulation under an anæsthetic. Special atention is directed to oblique fractures of the clavicle, which almost invariably unite with more or less deformity. The author considers that many of these cases should be treated by operative interference.

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FOOTE (S. M.). "Suture of the clavicle for simple fracture."—*Medical News*, May 28th, 1898.

THE following case is recorded: A healthy, well-built lad, thirteen years of age, sustained a fracture of the right clavicle, rather outside the middle of the bone, two months before his admission to hospital. The fracture united with the fragments overlapping for more than one inch. Operation was decided upon, the union was broken down, the ends of the bone were drilled, and a stout kangaroo-tendon suture was passed through them and tied. The arm was confined to the side for ten days, and was carried in a sling for another ten days. The patient made a good recovery, with a minimum amount of deformity.

An operation of this character has seldom been reported in America. In Germany, France, and Italy several surgeons have recorded cases. The author, after a study of reported cases, enumerated the following conditions, which may render suture of the clavicle advisable: (1) Irreducible deformity or constantly recurring displacement of the fragments. (2) Interposition of muscle between the broken ends. (3) Pressure upon or injury to a nerve. (4) Injury to a vessel, causing a large hæmatoma. (5) The projection of a sharp piece of bone under the skin. (6) Compound fracture. (7) As a secondary operation in cases of continued pressure upon nerve-trunks and in cases of non-union. In most of the operations previously reported the fragments have been joined with silver wire; in a few silk has been used, but in no case have the ends been united by an absorbable suture.

An excellent summary of the literature of the subject, with reference to the more important cases, is given.

J. E. Platt.

Midwifery and Diseases of Women.

UNDER THE CHARGE OF W. J. SINCLAIR, M.A., M.D.

ELY. "Virginal and senile endometritis."—*American Journal of Obstetrics*, February, 1898.

THE symptoms are similar in both. In the majority of cases there is a fœtid discharge, purulent in character, sacral pain and a sensation of bearing down. Frequent and painful micturition is often present. The general symptoms of anæmia generally co-exist. Menorrhagia may be a marked symptom, even in young girls. If, after a thorough trial, internal medication fails in unmarried girls, an examination should be

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made. Usually the cervix is eroded, the uterus slightly enlarged, and in all the author's cases there has been acute flexion. Treatment: Dilatation of the os and curetting.

Senile Endometritis.—The author relates a case where the patient had suffered for thirty years after the birth of her last child. The treatment consisted of dilating the os and washing out the uterus with a weak iodine solution, and a good result followed.

In these cases the important point is to eliminate malignant disease. In certain cases this can only be done by the microscope after curetting.

RUSSELL. "Vaginal implantation from adeno-carcinoma of the uterus."—*American Journal of Obstetrics*, March, 1898.

A SUPERFICIAL malignant growth of the vagina, of the adenomatous type, should arouse suspicion that the disease is an implantation from the primary growth in the uterus, since no glands exist in the vagina.

The author relates the following case:—Patient aged 46; four children; menstruation excessive for the last three years; leucorrhœa, offensive at times; steadily losing flesh. Vaginal examination: A friable fungating tumour present on posterior vaginal wall. Cervix shows no change. Uterus freely movable, not enlarged or irregular. The tumour was removed and proved to be an adeno-carcinoma. The patient was discharged in twenty-two days, with the wound completely healed. Eight months later she was re-admitted with recurrence of the symptoms. On examination the wound was found to be perfectly healed. The uterus was enlarged, hard and irregular in outline. An exploratory laparotomy was performed, but the growth found to be too advanced for removal. The abdomen was consequently closed. On curetting the uterus, material was obtained which proved the presence of adeno-carcinomatous disease of the body.

The confusing symptom is that the vaginal growth may cause extensive bleeding, when the growth in the uterus is not sufficiently advanced to cause a manifest increase in size or change in shape. Immediate re-appearance of hæmorrhage after removal of a cancer of the vagina should suggest a thorough examination of the uterus, including curetting. As to the method in which this implantation occurs, there must be an abrasion of the mucous membrane on which the cancer cells are deposited. A benign ulcer has been the starting point in some cases; pessaries, injuries by instruments and irritating leucorrhœal discharge in others. Recurrence in the region of the scar, after hysterectomy for malignant growth, is, according to Winter, due to inoculation of healthy tissue with cancer cells.

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VINEBERG (H. N.). "Hysterectomy for acute puerperal septic metritis: Recovery."—*New York Medical Journal*, April, 1898.

THE author gives full details of two cases. On cutting open the uterus, in each case, a portion of placental tissue was found firmly attached to the fundus, which previous curetting had failed to remove.

The symptoms in these cases often develop between the sixth and tenth day, when the patient has a chill and the temperature rises. The lochial discharge is scanty, and there is no fœtor.

Treatment: The patient should be anæsthetised, and the vagina and vulva rendered as aseptic as possible. The uterus should then be dilated, and the whole of the interior should be gently traversed in all directions with the sharp curette with the object of removing any retained tissue. This should be followed up by frequent irrigations to wash away necrotic tissue. In many cases of puerperal sepsis this is sufficient. In other instances, however, the symptoms do not abate, and then hysterectomy may be considered. A rise of temperature to 103° may indicate it, but the pulse is a more important guide, and should it rise to 130, and grow small and weak, no time should be lost. A wiry pulse and a distended abdomen are signs that the inflammation is spreading to the general peritoneum. Removal of the gross source of infection at this stage usually prevents further progress of the peritonitis. According to the author, the abdominal route is preferable to the vaginal for extirpation of the uterus in puerperal sepsis. The uterus is unusually large; it is essential to ligate the broad ligaments far out, and, further still, the freest drainage in both directions should be provided for.

SHOBER (J. B.). "Celiotomy for appendicitis and retroversio uteri; intestinal paresis: Recovery."—*American Journal of Obstetrics*, March, 1898.

FULL details of the case are given. The symptoms of intestinal paresis, following an abdominal operation, usually manifest themselves about the same time that sepsis may be looked for, *i.e.*, during the first or second day, and with the exception of high temperature, which accompanies sepsis, they are very much the same: a distended abdomen, often accompanied by severe pain, distressing nausea, and vomiting, intense thirst, an anxious drawn expression, pallor, and a moist skin. There is usually marked nervous excitability. The pulse is small and rapid, 118 to 130, but not often very weak. The temperature, however, may rise to 101° or 102°, and then it is most difficult to differentiate the symptoms from those of beginning sepsis. If the abdominal distension be not rapidly relieved, the patient may collapse from heart failure, or from exhaustion due to the constant vomiting and the impossibility of

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retaining nourishment. It is most important to differentiate between intestinal paresis and beginning sepsis, for whereas in the latter re-opening, flushing, and free drainage will sometimes save the patient, such a procedure in intestinal paresis would probably be followed by a fatal result. Death in these cases is due to interference with the action of the heart and lungs, due to the abdominal distension.

At the autopsy no lesion is found, with the exception of distended small intestines.

Etiology.—The author believes that a spasm of the ileo-cæcal valve exists which prevents the escape of gas into the colon. This is due to an influence upon the sympathetic ganglia. The theory that the muscles of the intestinal walls are paralysed, and that in consequence gas accumulates, does not seem to him satisfactory, as it does not account for the fact that the gas does not escape into the colon.

The chief object of treatment is to establish active peristalsis of the bowels, and the best remedy is hourly doses of one-half to one grain of calomel, in conjunction with rectal enemata repeated every four hours. The rectal tube often aids the escape of flatus. The heart must be supported, and the nutrition of the patient kept up. Owing to the constant vomiting and nausea, reliance must be placed on nutrient enemata. For the heart, hypodermic injections of one-twentieth of a grain of strychnia every four hours, with whiskey, by enema, are usually sufficient. Peristalsis, once established, is usually progressive, and the patient goes on to recovery. *T. V. Cunliffe.*

Bouilly (G.). "On serous peri-uterine exudation."—*La Semaine Gynécologie*, March 1st, 1898.

Collections of serous fluid in the pelvis are frequently present during attacks of pelvic peritonitis, secondary to uterine or appendage inflammation.

In acute cases the exudation may be present from the first appearance of the symptoms. It is especially frequent in connection with suppurative conditions of the tubes or ovaries. Serous exudation may also be present with healthy appendages, the uterus being the source of infection, which is conveyed by the lymphatics. In puerperal cases the serous exudation tends rapidly to become purulent, and the result is general peritonitis.

The usual situation of the serous collection is in the posterior *cul-de-sac*. It often extends up the sides of the uterus, and may be felt in the iliac fossæ.

The quantity of fluid varies from a few drachms to a pint or more, and is usually limited by thin peritoneal adhesions.

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In subacute or chronic cases the diagnosis can only be made by discovering a fluid collection at the sides of and behind the uterus. In acute cases, usually secondary to tubal inflammation, the exudation may, in the course of a few days, become very extensive, filling up the fornices, and being readily recognised in the iliac fossæ. Fluctuation may even be detected. The temperature is high, vomiting may supervene, and everything points to the presence of pus. At the end of a few days, however, the symptoms may rapidly subside, and the exudation becomes absorbed partially or entirely.

In these cases, if an examination be made per vaginam, fluctuation can be detected in the posterior fornix, with little thickening of the intervening tissues.

M. Bouilly has noticed these collections of serum suddenly disappear to a great extent during examination, and the fluid is then rapidly absorbed by the peritoneum.

The *treatment* of these cases should be expectant. Surgical interference is not required in the acute stage. If, however, the exudation becomes much increased, and the general symptoms are severe, with signs of general peritonitis or of the formation of pus, operation is required, the nature of the procedure depending on the condition of the appendages.

LINDENTHAL. "Researches on the development of gas in the uterus."—*Monatschrift für Geb.*, Band VII., p. 269, 1898.

PHYSOMETRA, which is characterised by the presence of offensive smelling gas in the uterine cavity, is due to the growth of organisms "in utero." Some writers have attributed this to the bacterium coli; others have described a special bacillus. The author has been able to examine the uterine contents in four cases of physometra. He has found a special anaerobic bacillus, one of the group of bacillus of œdema, to be constantly present. Twice he also found the bacterium coli, and in one case streptococci and staphylococci.

He also made some experiments on animals with cultures of the bacillus coli and of the anaerobic bacillus. The latter is analogous to the bacillus of emphysematous vaginitis, and if a pure culture be inoculated with amniotic fluid gas is produced.

Further if a culture be introduced into the amniotic cavity of a pregnant bitch an affection analogous to physometra is produced. Hence this bacillus is probably the essential factor in causing this condition. The bacterium coli, on the contrary, does not generally produce gas, although it may do so if the amniotic fluid contains sugar.

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Bentauer (O.). "Peculiar condition of the uterus during the passage of instruments."—*Centralblatt für Gynaecologie*, No. 42, 1897.

Ahlfeld. "Entrance of the sound into a patent Fallopian tube."—*Centralblatt für Gynaecologie*, No. 47, 1897.

Courant. "Perforation of the uterus during curettage."—*Centralblatt für Gynaecologie*, No. 48, 1898.

Bentauer records two cases in which instruments could be passed into the uterus to a variable depth without being followed by any symptoms suggestive of perforation. In one patient in whom the uterus bimanually was not enlarged, the sound entering $2\frac{3}{4}$ inches, he found that under anæsthesia a dilator could be passed to a depth of six inches. He repeated this observation several times, finally washing out the uterus and packing with gauze. The patient made a rapid recovery, without any bad symptoms. In a second case he found that the dilator entered to a depth of three inches, but a sound was readily passed to a depth of eight inches or more. Bimanually the uterus was not enlarged. Curetting was carried out, and the convalescence was normal.

In these cases he feels assured that no perforation of the uterine wall occurred, but is firmly of opinion that the uterine muscle may relax or become elastic under the pressure of instruments.

Ahlfeld admits that a sound may at times pass into the Fallopian tube if it is abnormally patent, and quotes a case in which this appears to have occurred.

Courant records a case of fibroid uterus in which curetting was performed. The sound during the operation passed to a depth of nine to ten inches. Hæmorrhage, however, continued to be severe, so it was decided to perform abdominal section. It was found that a rupture of the posterior wall of the uterus had occurred, and Douglas' pouch contained a considerable quantity of clotted blood. He believes that without the use of undue force the uterus may at times be so softened that perforation may readily occur. This may be brought about after labour by subinvolution or infection. It may also be secondary to constitutional disorders, or tumours, such as fibroids and cancer.

Jahreiss. "Relaxation of the uterine wall during curetting of a patent Fallopian tube."—*Centralblatt für Gynaecologie*, No. 10, 1898.

Two cases are recorded in which the curette penetrated to an unusual depth in the uterine cavity.

Case 1.—The patient had hæmorrhage several months after an abortion; the uterus was of normal size and anteflexed. During

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the operation of curetting the instrument suddenly penetrated to a considerable depth without giving the sensation of any abnormal resistance. It was found that the curette was directed towards the right side of the fundus. The operation was completed, and the patient made an uneventful recovery.

Case 2.—The patient was very anæmic, following an abortion. The uterus was bulky and anteflexed. Fourteen days after the miscarriage she was curetted, several fragments being removed. Suddenly the curette sank inwards up to the handle without giving the sensation of having penetrated the uterine wall. On removal of the instrument profuse hæmorrhage came on. The uterus and vagina were packed with gauze, and the patient recovered rapidly without any bad symptoms.

The author thinks that in Case 1 the curette undoubtedly entered the Fallopian tube, and Case 2 he now inclines to attribute to a similar cause, suggesting that the free bleeding may even have been from the region of the fimbriated end. At the time of operation he admits that he felt certain that a perforation of the uterus had occurred.

GLAESER. "On perforation of the uterus during curetting."—*Centralblatt für Gynaecologie*, No. 6, 1898.

THE patient was middle-aged, and had been confined three months previously. The uterus was bulky, and for the purpose of examining it the sound was introduced. Without any apparent difficulty it entered the uterus up to the handle. It was withdrawn, and passed again with a similar result. Glaeser considered that the uterine wall was perforated, and decided to extirpate the uterus per vaginam. This was immediately performed. After removal four small perforations were seen to the left side of the fundus. The uterus was not large, and the walls were of normal thickness. The fundus, however, was extremely soft, and showed fatty changes; the cervix was of a natural consistence. The sound, it was seen, could be readily passed through the uterine wall without any sensation of resistance. From this observation it is evident that the uterus may after labour or abortion be so softened that perforation can readily occur, and in these cases, also, the curette may bring away a large portion of the uterine wall without the use of any undue force.

BROTHERS. "Accidental perforation of the uterus."—*American Journal of Obstetrics*, April, 1898.

AFTER a brief survey of the literature on this subject the author records a recent case from his own practice. The patient, aged 37, unipara,

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was suffering from prolapse of the uterus, the result of laceration of the pelvic floor. The uterus was bulky, and the seat of chronic endometritis; the appendages were normal. Ether was given, and the cervix dilated. The curette was now introduced and passed into the uterus to the depth of 4½ inches. Curettage was performed and completed, although Dr. Brothers felt certain he had perforated the uterus or that the curette had entered a patent Fallopian tube. He therefore decided to explore further. The bladder was separated from the vagina and the peritoneum opened in front. On passing the finger over the fundus uteri the gauze which had been packed into the cavity was plainly felt projecting into the peritoneum. The tear was now exposed, and seen to be a quarter of an inch in length. The gauze was pushed back, and the rent closed with catgut sutures. Vaginal fixation of the uterus, followed by perineorraphy, was then performed. The patient made a rapid and complete recovery. The author, however, does not think it is necessary to suture the wound in the uterus in every case of perforation. He would omit uterine douching, and provided no sepsis had been introduced, the case will probably do well.

Blondel. "A case of bipartite uterus, resembling perforation, during curetting."—*La Gynécologie*, April, 1898.

The patient, aged 25, multiparous, had symptoms of chronic endometritis. The uterus was slightly enlarged—recognised bimanually and by the sound.

The cervix was dilated under an anæsthetic and the curette introduced. During the operation the instrument was suddenly felt to penetrate deeply into the uterine wall, and Dr. Blondel had no doubt that perforation had occurred. The uterus was gently douched, and the patient made a rapid recovery. Six months later, however, the symptoms returned, and it was decided to repeat the curetting. During the operation the curette was again felt to sink deeply at the region of the right uterine cornu. It was decided to dilate the cervix with tents, and make a digital exploration of the uterine cavity. It was then discovered that beyond the right cornu of the uterus a pouch existed 1½ inches in depth, into which the curette had penetrated on each occasion.

This condition of the uterus is extremely rare, and can only be recognised by digital examination of the uterus. In this case, also, an intra-uterine speculum and electric lamp were used, and the opening at the right cornu was plainly seen.

Arnold W. W. Lea.

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Pharmacology and Therapeutics.

UNDER THE CHARGE OF D. J. LEECH, M.D., D.Sc., F.R.C.P.

TYSON (JAMES). "The treatment of obstinate dropsies."—*The Therapeutic Gazette*, January 15th, 1898.

"BETWEEN a blind confidence in drugs which makes a fair estimate of therapeutics impossible, and an equally blind scepticism which nullifies therapeutics altogether, lies a golden mean of rational treatment, the results of which are at once an encouragement to the practising physician and a stimulus to further effort to extend the usefulness of our art."

In the present paper Dr. Tyson attempts to substantiate the proposition which he thus enunciates by illustrations drawn from the treatment of chronic dropsies. This subject is selected because it is a condition uninfluenced by mental impressions, a condition which never passes away of itself, going on from bad to worse if left alone, and a condition which unfortunately too often resists treatment altogether. Contrary to what one would expect, the difference in the treatment, according as the etiological basis is heart, kidney, or liver, is not usually very great. This is Dr. Tyson's apology for elevating for a time to the dignity of a disease what he recognises as truly a symptom.

A patient with general anasarca has his tissues distended with serum—water logged, as it were. There is effusion into one or both pleural sacs, and probably into the peritoneal cavity. The water thus stored away hampers movement, interferes with important functions, and gradually reduces strength. The task is to get rid of this dangerous accumulation.

This object may be accomplished, first, by cutting down the liquid ingested and, secondly, by increasing the output of liquids. The first of these has received less consideration than it deserves. Dr. Tyson thinks we have taken a decided step to the attainment of our object when we limit the ingestion of liquids, or reduce them to a minimum. He finds the most satisfactory way of doing this is to restrict the patient to a milk diet. He begins with two to four ounces every two hours, keeping this up till the patient begins to complain of hunger. Often the dropsy does not begin to disappear till hunger is complained of. After a decided effect is produced on the anasarca, or it has entirely disappeared, the quantity of milk is grudgingly increased. Then, gradually, other articles of food are added until the patient's appetite is satisfied.

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This restricted diet has the further important advantage of favouring the second part of the treatment—viz., the withdrawal of the superfluous fluid from the body. Dr. Tyson has frequently found that a patient would not respond to diuretics whilst eating freely.

Rest in bed is an indispensable condition of the successful attainment of the second part of the treatment. In cardiac and renal cases rest alone will sometimes entirely remove a dropsy.

Rest and regulated diet secured, measures to increase the output of fluids by the kidneys, bowels, and skin, may be adopted. It is waste of time to give diuretics without the preliminary action of a purgative. The saline purgatives are most suitable. Dr. Tyson uses Rochelle salt —half-an-ounce to an ounce half-an-hour before food, preferably before breakfast. Epsom salts are probably more efficient but less palatable. The compound jalap powder is also an admirable aperient in one or two drachm doses. Calomel, in doses of $7\frac{1}{2}$ to 10 grains, with an equal quantity of sodium carbonate, may be substituted, but the mercurials act more slowly than the salines; but they are useful adjuvants in hepatic disease with ascites. It is of great practical importance to give the saline in as small a quantity of water as possible, preferably not more than four ounces. Having secured a free action of the bowels, with the patient at rest on a restricted diet, we may select a diuretic. "No question of general therapeutics is more unanimously answered than that digitalis is the best diuretic available." The tincture is the most suitable preparation, though clinically it is sometimes useful to substitute the infusion for it. Digitalis is better administered in full doses at longer intervals than in small doses at closer intervals. Dr. Tyson begins with ten minims of the tincture four times a day, or fifteen minims three times a day. We should wait at least 48 hours before concluding on its action. If no diuretic effect is produced by the end of this time the dose may be increased to a drachm in the 24 hours, which Dr. Tyson does not often exceed. The effect is also recognised by a slowing of the pulse, and should this fall to sixty, or should an irregularity appear in a formerly regular pulse, the drug should be discontinued. Theoretically at least, nitroglycerine is advantageously associated with digitalis, and, practically, it is without disadvantage. It is a drug of prompt action and short duration. It is best given at short intervals—$\frac{1}{100}$ to $\frac{1}{50}$ grain every two hours.

Digitalis is a drug which must be intermitted both to secure its efficient action and to avert its toxic effects. The drug which should be substituted for it varies somewhat with the cause of the dropsy. In cases of *cardiac* disease, Dr. Tyson prefers theobromine, which, in a large experience, he has found very valuable; at times even superior to digitalis. He gives 45 grains in the 24 hours, in doses of $7\frac{1}{2}$ grains

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every three hours. The dosage is kept up for six days, and on the last day digitalis is associated with it and continued after the theobromine is stopped. The diuretic effect is sometimes marvellous—as much as 119 ounces in the 24 hours. Theobromine is conveniently administered in hot milk; it may be taken dry on the tongue, followed by a mouthful of water.

Dr. Tyson has come to the conclusion that though theobromine is so efficient, diuretin is almost useless, a rather singular fact considering diuretin is said to contain 50 per cent of theobromine.

Some years ago Dr. Tyson used caffeine a good deal as a diuretic, with fairly good results, but of late he has not found it so satisfactory.

In the dropsy of *renal* disease a diuretic which is not sufficiently appreciated is sparteine sulphate, the active principle of broom. It has been given in too small doses. The dose should never be less than $\frac{1}{4}$ grain to adults, to the amount of 2 grains in the twenty-four hours. It may even be increased to 3 or 4 grains in this period.

Strophanthus is a drug which has met with much favour, but Dr. Tyson has been greatly disappointed with it. Any results he has secured have required doses as large as those of digitalis.

Dr. Tyson never feels he has done his duty towards a case of obstinate dropsy when other measures have failed till he has tried the time-honoured combination of calomel, squill, and digitalis. Occasionally he has seen marvellous effects from the combination, particularly in cardiac dropsy, when given in doses of calomel $\frac{1}{2}$ grain, digitalis 1 grain, and squill 1 grain, every three hours until diuresis, free purgation, or both, have been obtained.

The skin has been mentioned as one of the natural channels availed of to secure elimination of water. It is not usually so satisfactory as the kidneys or bowels, because of the unpleasant effect on the patient of copious diaphoresis, the chief symptom complained of being a profound weakness. Why this should occur is not plain. Doubtless it is sometimes exaggerated by the patient. Dr. Tyson refers to the hot air and vapour baths, the hot wet packs, and Simpson's bottle bath. He thinks the vapour bath more satisfactory and less uncomfortable than the hot air bath.

One drug only is markedly efficient to produce skin action, viz., jaborandi, or its active principle, pilocarpine. The latter is the most convenient preparation, administered hypodermically. One-fourth of a grain should be the maximal dose, and a powerful effect may be produced if it is associated with artificial warmth. Should dangerous œdema of the lungs arise it may easily be controlled by a hypodermic injection of $\frac{1}{100}$ or $\frac{1}{10}$ of a grain of atropine.

In dropsies due to heart disease the Schott or Nauheim treatment

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is destined to be a valuable auxiliary. Dr. Tyson gives formulæ for imitating at home the Nauheim baths. He also refers to the "Widerstand gymnastik." In his own practice Dr. Tyson has used massage along with the Schott treatment with good results. Massage alone is a valuable adjuvant in the treatment of dropsies, seeming to produce some absorption of the effused fluid.

There are cases in which all the resources described fail of their purpose, and liquid remains stored away in the interstices of the body, and in the serous cavities. The latter may require to be relieved by paracentesis of the chest and abdomen, and the former by punctures made with the needle, and incisions into the limbs or the scrotum. Southey's trocars are often of service. Sometimes spontaneous rupture of the skin occurs and large quantities of water thus drained away. Not unfrequently improvement seems to date from such rupture. Dr. Tyson details rather fully three cases which have been under his care, illustrating the three classes of dropsies due to the three causes, liver, heart, and kidney disease.

He hopes he has shown that much may be done for these intractable cases by judicious treatment, and that by patience, associated with abundant resources, an apparently hopeless case may even recover, and the word "cure" in its broadest sense be applied to its management. Timely and judicious changes in treatment are most important in these chronic cases, while hasty and thoughtless changes are harmful.

Briggs (Alexander B.). "Strontium and its salts."—*Cincinnati Lancet-Clinic*, January 29th, 1898.

The author combats the idea that there is danger in the use of the strontium salts, owing to their toxic effects. The researches of Germain Sée, Constantin Paul, and Dujardin-Beaumetz have shown that toxic effects reported from their use were due to the presence of barium in the strontium salts employed.

Dr. Briggs uses only the pure salts, and believes that their employment has been so successful that they deserve to be more highly appreciated. The salts he has used most frequently are the bromide, iodide, and lactate.

Bromide of strontium is a colourless, transparent salt, occurring in hexagonal crystals. It is somewhat deliquescent; it is soluble in both water and alcohol; it is not incompatible with the bromides of the alkalies; and it can be administered with all the alcoholic tinctures and most fluid extracts. The dose is from 5 to 60 grains. The indications for its use are the same as for potassium bromide. Even in large doses taken for a long time it does not seem to produce the untoward effects,

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such as gastric disturbances, cutaneous eruptions, and systemic depression, so often noticed in the use of the potassium salt.

In cases of epilepsy, when the potash salt has lost its effect, the strontium salt may often be substituted with safety and advantage. Dr. Briggs has found strontium bromide of service in many diseases of the stomach. In three obstinate cases of vomiting of pregnancy two received signal benefit. In one case of hyperæsthesia of the stomach following ulcer and continuing some weeks after the ulcer had healed, the neuroses promptly yielded to 10-grain doses of the drug, given half an hour before food.

Dr. Briggs speaks of a class of patients who are plethoric, who complain of lassitude, frontal headache, constipation, a disposition to sleep at all times, various skin diseases; the urine is loaded with urates, and frequently the heart's action is feeble; these patients are sometimes fat, other times lean, but are always overfed. In such cases the symptoms will be relieved by bromide of strontium, administered before meals, accompanied by a restricted diet.

In cases of digestive disorders, with acid fermentations and chronic diarrhœa, the bromide has also given excellent results.

Strontium iodide occurs in colourless, transparent, hexagonal crystals, having a bitter saline taste, freely soluble in water and alcohol. Like the bromide salt, it is incompatible with sulphates and carbonates of soda, potash, and lime, but it is not incompatible with other iodides. It is an excellent tonic and alterative, and may safely be prescribed in any case where the potash salt is indicated. The author has never known it produce the gastric irritation and palpitation of the heart so common during the administration of potassium iodide in full doses. Its effects in catarrhal asthma, chronic bronchitis, and cardio-pulmonary affections have been most satisfactory. The drug is quickly eliminated by the kidneys, the strontium seeming to supplement the action of the iodine by its action on the functions of nutrition. Dr. Briggs believes that the dose can be pushed far beyond the limit of safety for the potassium salts without fear of producing symptoms of intolerance.

Strontium lactate is a white granular powder, odourless, and with a slightly bitter saline taste. It is soluble in about 4 parts of water, and freely soluble in alcohol; dose from 5 to 60 grains. Cases have been reported where as much as 160 grains have been given with no untoward effects. It has often been prescribed for Bright's disease, both in acute and chronic forms, with excellent results. Constantin Paul concludes that it is indicated in parenchymatous nephritis, in the rheumatic and gouty forms, but not in interstitial nephritis. The remedy has the advantage over other drugs in aiding digestion and assimilation, and it can be administered for a long time continuously without ill effects.

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In two cases of albuminuria of pregnancy Dr. Briggs obtained gratifying results from the use of strontium lactate. In several cases of cystitis in old people due to hypertrophy of the prostate, given in combination with buchu, the drug markedly ameliorated the symptoms. Though apparently not a diuretic, its action on the urinary organs seems very salutary.

Bartholow states that phosphate of strontium improves the appetite, promotes the activity of assimilation, and increases the body weight. Recently the salicylate of strontium has been highly praised in the treatment of rheumatism.

As untoward symptoms so frequently follow the use of the potash salts Dr. Briggs thinks they might frequently be replaced by the strontium salts to the advantage of the patients.

Francis J. H. Coutts.

ALLEN (ALFRED H.) "A proposed new method of examining pepsin."—*Pharmaceutical Journal* (4), Vol. V., 561.

As the mere conversion of albumin into syntonin or other soluble form has been included with true peptonisation characteristic of the action of pepsin under the term "digestion," the author considers that pepsin assaying is in a very unsatisfactory condition. He refers to Harding's observations (*Pharmaceutical Journal* (3), XXV., 914) as showing the action of hydrochloric acid in the conversion of albumin into syntonin, and the subsequent peptonisation of the syntonin by pepsin. The true measure of the activity of a pepsin is the amount of mixed peptones and albumoses formed by its action under specified conditions. Kremel's method of assay, which permits of the determination of the amount of digestion products formed, is an improvement upon the other methods in common use; but the author thinks it suffers under the disadvantage of not allowing of any distinction being drawn between the albumoses and the true peptone, which is the characteristic product of proteolysis by pepsin. Last year the author, in conjunction with Mr. A. B. Searle (*Analyst*, 1897, p. 259), devised an improvement of Rideal and Stewart's (*Analyst*, 1897, p. 228) process for the precipitation of proteids, the improvement consisting in the substitution of bromine water for chlorine gas. It was found that practically the whole of the nitrogen of gelatin, gelatin-peptone, egg-albumin, syntonin, and the mixed products of the acid-pepsin digestion of egg-albumin were thrown down as a precipitate on the addition of bromine water. In applying this reaction to the assay of pepsin the author uses the Bömer method of precipitating all proteids other than peptones by saturating the solution with zinc sulphate. He then acidulates the filtrate with hydrochloric acid, and precipitates the

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peptones by means of bromine water. After suitable washing, the nitrogen in the precipitate is determined by Kjeldahl's process, and from this the amount of peptone is deduced; due allowance must be made for the nitrogen contained in the pepsin. Full details of the process are given in the paper, as well as interesting tables of results which have been obtained. In so far as these results are absolute the process appears to be an advance upon the comparative methods in use. The manipulations, however, are so much more tedious that it seems doubtful whether the process will displace the less tedious methods which, if the conditions are rightly controlled, yield useful concordant results.

GALLOIS and BONNEL. "L'emploi de l'eau oxygénée comme moyen de traitement des vomissements incoercibles de la grossesse et de la tuberculose."—*Journal de Pharm. et de Chim.*, No. 7, p. 364, 1898.

THE authors have prescribed for three years oxygenated water for cases of these classes, and they have been very rarely unsuccessful in their treatment. They use the oxygenated water, diluted in the proportion of a tablespoonful to a litre of water mixed with some wine or milk. Silver spoons should not, of course, be used for measuring or mixing the water. It is sometimes necessary to continue the treatment for two or three weeks to prevent the return of the attacks.

LINOSSIER. "Des accidents éruptifs dus à l'emploi de l'exalgine."—*Journal de Pharm. et de Chim.*, No. 8, p. 413, 1898.

THE patient was an arthritic and hysteric woman, 35 years of age, affected with biliary calculus, and presenting in the urine neither sugar nor albumin. Antipyrine having always produced in this case characteristic eruptions, she one day took instead, for the mitigation of an attack of migraine, a cachet containing 0·25 gramme (4 grains) of exalgine. This solitary dose in a short time produced upon the skin and the mucous membrane of the anus and vagina a general papulose eruption, with patches of a fiery red colour, and, in certain spots, large blisters, containing a clear serous fluid. The rash, which lasted four days, caused pain when pressure was applied, but it was not pruriginous. In the course of the discussion upon M. Linossier's note, M. Bardet remarked that the doses of exalgine, as set forth in the various formularies, are too high. He considered that the maximum dose for 24 hours should be—for a man, 0·25 gramme (4 grains), and for a woman, 0·15 gramme (2½ grains).

William Kirkby.

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MACKNESS (OWEN). "Quinine as a substitute for ergot in midwifery." AN interesting article on this subject appears in the *Edinburgh Medical Journal* for May, 1898. The author points out that, although the use of ergot is almost universal amongst practitioners, and also, unfortunately, amongst midwives, modern teaching strongly condemns its use, except under certain definite conditions. The disadvantages of ergot are mentioned as follows:—(1) Its preparations are unreliable. (2) It is difficult to administer. (3) It "causes tetanic contraction of the uterine muscles, with occasional increases of violence. There is no complete relaxation between the spasms, as in ordinary labour pains" (Brunton). This is dangerous to mother and child alike. (4) It is said to cause occasionally "hour-glass contraction of the uterus."

For quinine the author claims the following advantages:—(1) Its preparations are not variable; (2) it can easily be administered in the form of a pill, which will keep for any length of time without deterioration; (3) it does not cause tetanic contraction of the uterus, but merely increases the strength of the labour pains while allowing complete relaxation between them.

It is pointed out that quinine, like other oxytocics, must not be given when there is any mechanical hindrance to delivery, such as a disproportion in size between the fœtus and the pelvis. Given in cases of delay caused by general exhaustion or pure uterine inertia, the author gathers from his own experience that quinine has on numerous occasions obviated the necessity for using forceps.

He uses 4-grain pills of the sulphate, gives two of these to begin with, and, if necessary, another an hour later. Sometimes yet a fourth is used. No headache, deafness, or noises in the ears have been observed to follow these large doses.

Three typical cases are described, being chosen as illustrations from a large number of similar ones.

The author, therefore, supports the view that ergot should never be used in labour; but that after the removal of the placenta, if bleeding occurs, it should be given in large doses. He also allows that ergot is useful, in small doses, in threatened abortion when hæmorrhage occurs without pains, the os uteri being closed.

CREMER. "Phlorizin and the secretion of milk."—*Münch. med. Woch.*, No. 5, 1898.

CORNEVIN has stated that by injecting phlorizin into cows the percentage of sugar in their milk could be almost doubled. Supposing this assertion to be correct, it is imaginable that a very useful milk for the artificial feeding of infants might be obtained from cows by administering this substance. (*Comptes Rendus*, CXVI.)

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Cremer, however, describes experiments of the same kind which he has made on a cow which was kept for the time on a carefully measured diet of hay—a precaution which, he insinuates, was omitted by Cornevin. He found the percentage of sugar in the milk to be slightly increased, though not nearly so much as stated by Cornevin. The total amount of milk was, however, in Cremer's cow considerably reduced, so that the total output of sugar in the milk was actually lessened. No grape sugar could be found in the milk. The urine contained a large quantity of sugar, which confirms the observations of Mering, Schaller, and others. Pappenheim has experimented on a goat, with results similar to those of Cremer (*Archiv für Verdauungs krankheiten*, Bd. III., H. 4). *W. E. Fothergill.*

"Tannalbin as an intestinal astringent."—*Edin. Med. Journal*, Jan., 1898.

PROFESSOR VIERORDT, of Heidelberg, strongly advocates the use of tannalbin in cases of acute and chronic intestinal catarrh, and also in tubercular diarrhœa.

The action of the drug was most remarkable, causing very rapid diminution in the number of the motions and in the quantity of mucus passed. The dose for children varies from four to eight grains. The writer places tannalbin, without hesitation, in the first rank of astringent preparations, and regards it as a most reliable drug in the treatment of all kinds of diarrhœa, whether simple or tubercular, and it possesses the advantage of causing neither dyspepsia nor loss of appetite. He considers it a more reliable drug than bismuth in the treatment of infantile diarrhœa. —*Deutsche med. Woch.*, 1896, No. 25.

"Diuretic action of caffein sodium salicylate."—*Centralblatt f. inn. Med.*, No. 3, 1898

SIEGERT (*Münchener med. Wochenschrift*, 1897, Nos. 20 u. 21) records some observations on the diuretic actions of caffein sodium salicylate and of pure caffein on a patient with chronic peritonitis who was tapped 90 times for ascites. By salicylate of soda in small as well as in large doses diuresis was every time decreased with an increase of the sp. gr. of the urine. Marked diuretic action after giving pure caffein was exceptionally observed, and it was decreased by combining the caffein with salicylate of soda in the form of caffein natro-salicylicum. The diuresis was suppressed by the administration of salicylic acid. On the other hand pure caffein developed its strongest diuretic action after previous exhibition of small doses of salicylic acid.

In all cases, therefore, where caffein is given as a diuretic its combination with salicylic acid is unadvisable. Siegert recommends the combination of caffein with digitalis in all cases where venous congestion being present though the kidneys are intact there is a possibility of removing œdema by the production of diuresis. He recommends a grain of caffein and 3-10ths of a grain of powdered digitalis leaf every two hours.

"Amyloform and dextroform."—*Münchener med. Wochenschrift*, 1897, No. 22.

AMYLOFORM is a combination of formaldehyde with starch, prepared by Classen of Aachen in 1896.

It is a white, very fine powder, absolutely tasteless, insoluble in ordinary fluid, and is not decomposed even by a temperature of 180°. It causes no irritation, and

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is free from danger. In the living organism it is broken up from formaldehyde being set free and starch separated. In cases of suppurating wounds and cavities its effects were equal to those of iodoform, and in some cases better. It is specially useful in soft ulcer.

Dextroform is a combination of dextrin with formaldehyde, and is easily soluble in water and glycerine. It is broken up in the organism like amyloform. A solution of 5 to 20 per cent has been used with good results as an injection in gonorrhœa. In empyema the chest cavity has been washed out with two pints of 5 to 20 per cent solution without any irritation being produced. It has acted well in some cases of bladder catarrh.—*Centbl. f. inn. Med.*, No. 3, 1898.

"Coley's fluid in inoperable tumour."—*Lancet*, April 9, 1898.

At a meeting of the Medical Society of London, Mr. W. H. Battle showed a man, aged 30, who had had syphilis six years previously. Four months before admission he noticed a lump under his right arm accompanied by pain, and soon followed by other swellings. Movement of the arm was difficult and it became swollen. Just before admission a lump formed above the right clavicle, and another over the right side of the sternum. There was a swelling below the clavicle which was caused by an elastic tumour of considerable size and irregular shape, which was fixed to the deeper parts but did not involve the pectoralis. In the axilla were numerous enlarged glands of various sizes. Iodide of potassium in increasing doses was given, but did not effect any improvement, so on January 5th portions were removed from the sternal and subclavicular growths, which proved on examination to be fibro-sarcomata containing giant cells. Thereupon he gave half-minim doses of Coley's fluid every other day from January 21st to March 21st, the iodide mixture being continued until March 6th. The dose was then raised to one minim every other day. The man had greatly improved in general health, and now presented only two swellings, one over the site of the sternal tumour, and the other under the clavicle, both being comparatively small. A remarkable feature was the absence of any reaction, the temperature having been normal throughout.

"Chlorinated soda in gonorrhœa."—*Journal of Cutaneous and Genito-urinary Diseases*, January, 1898.

Dr. Charles Chassaignac states that his experience since October, 1895, of the use of chlorinated soda has convinced him that it is superior to most of the agents generally employed as a local application in specific urethritis. Its use in the urethra seems to have been first suggested by Doyen, of Rheims.

Chlorinated soda is alkaline in reaction, which is probably an advantage; it is antiseptic and penetrating, yet not irritating. It is penetrating because, unlike many germicides, it does not coagulate albuminous substances.

Dr. Chassaignac uses dilutions of the officinal solution, liq. sodæ chloratæ U. S. P., of the strengths 1 part to 48, 1 to 32, and 1 to 24. In patients coming early, he begins with the weak solution, changing after the first week to the medium. The patient is directed to urinate first, to wash thoroughly with hot water, then to inject by means of a syringe of $\frac{3}{8}$ to $\frac{1}{2}$ ounce capacity the chlorinated soda solution first with the syringe one-third full, next with one-half, and lastly with an entire syringe full, retaining this in the urethra for two or three minutes. The usual instructions as to rest and restrictions in drink and food are given. Dr. Chassaignac has employed the method in nearly 500 cases with excellent results. It is rare that

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an acute, uncomplicated case, is not cured in four or five weeks, and a larger proportion get well much earlier. These solutions are also useful in gonorrhœal ophthalmia.

"The therapeutic and toxicological effects of chinosol."—*Lancet*, April 30, 1898.

CHINOSOL is now largely employed as a powerful and convenient antiseptic, and it is said to possess very distinct advantages over other antiseptic compounds previously in use. It is a yellow powder of definite chemical composition, soluble in water, and containing a quinoline group in combination with potassium and the sulphate radical. Its antiseptic, disinfectant, and deodorant properties have been determined with very satisfactory results by Dr. Klein. The internal administration of chinosol to human subjects has been tried by Dr. Cipriani, whose results are recorded in the *Lancet* of November 27, 1897. In this communication the treatment of tuberculosis with chinosol administered by the mouth, or injected locally, was followed by a rapid and apparently permanent improvement. Professor Hobday, F.R.C.V.S., of the Royal Veterinary College, has contributed an interesting and instructive paper to the March number of the *Journal of Comparative Pathology and Therapeutics*. His experiments related to cats, dogs, and donkeys. The summary of Professor Hobday's results is as follows :—

(1) Chinosol acts well as an antiseptic, disinfectant, and deodorant when used in certain proportions.

(2) Its action is better marked when used as a lotion than when used as a powder.

(3) The powder is not suitable for use on fresh wounds unless diluted in some way or other.

(4) For the disinfection of instruments care must be taken not to make the solution too concentrated, as otherwise the instruments lose their edge, and the handles become discoloured, and rough to the touch.

(5) The odrug possesses toxic properties.

(6) If used subcutaneously in too concentrated a form chinosol will produce local irritation and swelling. The strength recommended for subcutaneous injection in human practice is from 1 to 600 to 1 to 200, and certainly in veterinary patients this should not be exceeded.

(7) The cat is very susceptible to its action, and in this animal much more care is necessary to guard against toxic symptoms than in the case of the dog. In the cat, if subcutaneously injected, the extreme limit of dose should be one sixteenth of a grain for each pound body weight, and in the dog one eighth of a grain per pound.

(8) The chinosol is not rapidly absorbed from the unbroken skin of the dog, and can be applied for several days in succession, even in fairly concentrated solutions, to the skin of this animal without producing eruptions or sores.

(9) The chief symptoms of poisoning are :—sneezing and coughing and increased flow of thick ropy saliva, subnormal temperature ; staggering gait, commencing with loss of motor power in the hind quarters; great prostration, and ultimately death from failure of the heart's action.

(10) The chief post-mortem characteristic is the smell of chinosol on or in some parts of the body, whilst another symptom to be looked for is the presence of frothy saliva in the pharynx, œsophagus, or stomach.

"Opium in heart disease."—*Canadian Practitioner*, May, 1898.

MCPHEDRAN believes that in the treatment of cardiac failure in cases of severe heart disease the value of morphine is not sufficiently recognised.

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In advanced cardiac disease, complete rest of body and mind, aided by free administration of cardiac tonics and the judicious use of purgatives, often fails to give relief. The heart remains irritable, and its action becomes increasingly irregular. Severe dyspnœa causes the patient to wake up almost as soon as he gets to sleep. The distress from the dyspnœa is great, but that from want of sleep is greater. If the dyspnœa is not due in part to effusion into the pleura and œdema of the lungs, no remedy is so effectual for this condition as morphia. The comfort afforded by a hypodermic injection is almost incredible. Given by the stomach it often fails, even in much larger doses, owing to the slow absorption due to venous stasis in the mucous membrane of the stomach.

Dr. McPhedran gives hypodermic injections of morphia at bedtime. The doses he quotes as having afforded relief varied from $\frac{1}{80}$gr. to $\frac{1}{30}$gr.

Diseases of Children.

UNDER THE CHARGE OF HENRY ASHBY, M.D., F.R.C.P.

CONGENITAL SYPHILIS.

NEURATH (RUDOLF). "Beitrag zur Larynxsyphilis im Kindesalter."—*Jahrbuch für Kinderheilkunde*, Band XLI., p. 292.

THE author, after referring to the comparative rarity of larynx-syphilis in children, relates the following case which came under his notice. The patient was a girl of six years of age, and was brought to the hospital on May 8th on account of hoarseness, difficulty of breathing, and difficulty of swallowing. There was extensive caries of the hard palate, and a cleft was thus formed between the cavity of the nose and mouth. There was some chronic enlargement of the glands of the neck, axilla, and groin. Her speech was nasal and hoarse. An examination of the larynx showed the epiglottis to be ulcerated along the edge and shrunken, the vocal cords were swollen and infiltrated and their movements interfered with. On drinking, some of the fluid regurgitated through the nose. The respiration was easy but noisy. The treatment consisted in mercurial inunctions.

Considerable improvement followed the treatment. The edges of the fissure in the hard palate became covered with granulations, and the healthy condition of the tissues enabled a plastic operation to be performed with complete success. The hoarseness and noisy respiration disappeared.

On the 26th of July she was brought back to the hospital with all the appearances of a high grade stenosis of the larynx. The expression was anxious, the inspiration stridulous, with indrawing of the intercostal spaces. Under treatment in bed in hospital the child again improved. But a day or two after admission the larynx stenosis became worse, and

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in spite of tracheotomy she died. At the post mortem there was found extensive ulceration of the epiglottis, and also of the mucous membrane of the larynx, with some caseation. Bronchial glands enlarged, studded with some grey spots and pigmented. Heart dilated, cicatrisation on the surfaces of the liver. There was also a defect in the hard palate.

The author believes that the ulceration of the epiglottis and larynx, taken in connection with the caries of the palate, was syphilitic, though he leaves it an open question whether it was complicated with tuberculosis.

Strauss has collected 14 cases of larynx-syphilis in children, but in this country at least it is rare. Caries of the hard palate in syphilitic children is comparatively frequent.

Heller (J.). "Weitere Mittheilungen uber einen Fall von chronischem Hydrocephalus bei hereditärer Syphilis."—*Deutsche med. Wochenschrift*, No. 5, 1898.

In June, 1890, Heller attended a woman, aged 36, in her confinement with a first-born infant. Forceps were used, but the head was not pathologically enlarged. Towards the end of July the infant exhibited an undoubted syphilitic rash, and was treated with bichloride of mercury, baths, and calomel ($\frac{1}{6}$ grain) three times a day. By the beginning of October it appeared quite normal and healthy. When seven months old it was seen again, suffering from chronic hydrocephalus. The head was enlarged, the fontanelles were wide open and bulging, and the veins of the face and scalp were dilated. The child was treated with potassium iodide internally (two or three grains daily), and in five months all signs of chronic hydrocephalus had disappeared. The author kept the child under observation, seeing it several times a year. There was nothing of interest to note till the summer of 1897. Then the child was over seven years of age, and suffered from a double interstitial keratitis. Later on condylomata developed on the lower lip, and periosteal gumma on the left humerus and tibia. The upper incisor teeth were distinctly "Hutchinsonian." The child was treated with mercury and iodide, and made a good recovery.

Elsner (Hans). "Hydrocephalus und angeborene Syphilis."—*Jahrbuch für Kinderheilkunde*, Band XLIII., Heft 4.

The author gives a short summary of the writings of other authors who have noted a connection with hereditary syphilis and chronic hydrocephalus. Leon d'Astros noted, in 2 cases, chronic inflammatory changes in the plexus choroiodes and membrane lining the lateral ventricles; Steffen and Birch-Hirschfeld have noted similar changes.

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The author's paper is based on observations made upon 18 cases of hydrocephalus. Of these, three had well-marked symptoms or signs of congenital syphilis. Among the remaining 15, 13½ per cent presented signs of enlarged liver and spleen, and which he believes were cases of hereditary syphilis, the result of an attenuated virus. He also noted that the apparently healthy mothers of hydrocephalic children aborted more frequently than mothers who had born healthy children.

BRESLER: Oberartz. "Ueber einen Fall von infantiler progressiver Paralyse."—*Jahrbuch für Kinderheilkunde*, Band XLIII., Heft 2 und 3.

THE patient was a girl of 13½ years old. The girl had been well till 12 years old, but since that time had not been able to attend school on account of her inability to learn. She had had chorea, was badly nourished, could not read, sew, or knit. Latterly she refused her food, and took no interest in what was going on around her.

The left pupil was dilated and sluggish. The patellar reflexes were lively, there was no paralysis, no tremor, a "tripping" walk, a stupid facial expression. No attention was paid to questions. Four months later there was slight right facial paralysis, increasing dementia, with attacks of clonic and tonic spasm. Two months later death occurred, preceded by symptoms of a general paralysis. At the post mortem there was thickening of the dura mater, cloudiness and œdema of the arachnoid. External hydrocephalus and atrophy of the convolutions. The changes in the liver suggested hereditary syphilis.

Henry Ashby.

Diseases of the Ear.

UNDER THE CHARGE OF W. MILLIGAN, M.D.

HOLT (EMMETT). "A report of five cases of abscess of the brain in infants, together with a summary of twenty-seven collected cases in infants and very young children."—*Archives of Pediatrics*, March, 1898.

IN this interesting and exhaustive report the author details much of interest and practical value. The conclusions he arrives at are as ollows:—

(1) Abscess of the brain in children under five years is rare.

(2) The principal causes are otitis and traumatism.

(3) It rarely follows *acute* otitis, but most often neglected cases, and is usually secondary to disease of the petrous bone.

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(4) In cases occurring in infancy without evident cause the source of infection is probably the ears, even though there is no discharge.

(5) The development of abscess after injury to the head without fracture to the skull is extremely rare. In nearly all of the traumatic cases definite cerebral symptoms show themselves within the first two weeks after the injury.

In cases with falls as remote as several months there is probably some other cause, such as a latent otitis.

(6) In a large proportion of the cases only general symptoms are present, and there is very great variety.

(7) Local symptoms may be misleading unless they are constant, and even then they may depend upon associated lesions such as meningitis. Motor symptoms only can be trusted, since the sensory symptoms are difficult or impossible to determine in infants or young children.

(8) Rapid progress, fever, and a history of injury, or otitis, generally make a diagnosis from tumour easy. In the slower cases, with little or no fever, valuable assistance may be obtained from lumbar puncture.

(9) From acute meningitis the diagnosis is more difficult, and in the cases in which there are only terminal symptoms the diagnosis is impossible.

In the more protracted cases the distinctive points with reference to abscess are the slower and more irregular course, and, as a rule, a lower temperature.

(10) On account of the great amount of shock attending brain surgery in very young children operations should not be urged unless definite localising symptoms are present, the principal one being hemiplegia.

CHEATLE (A. H.). "Antiseptic treatment of acute otitis media." *Archiv. of Pediatrics*, 1898.

THE writer remarks that one of the main objects in the treatment of acute otitis media should be to prevent infection from the meatus. The first thing to be done is to purify the auricle and meatus, to introduce a light plug into the meatus, and to apply a dressing and bandage to the auricle. Should rupture of the membrane not take place, the dressing serves a most useful function in aiding to procure functional rest to the part. When rupture does occur, and there is discharge, the dressing is taken out, and re-applied as frequently as is found necessary. A useful dressing is double cyanide gauze used in single layers, and thoroughly wrung out in 1 : 40 carbolic lotion to dissolve the irritating soluble cyanides.

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LEDERMAN (M. D.). "Mastoideocentesis."—*The Laryngoscope*, January, 1898.

IN a short editorial note upon this subject Lederman remarks that Leiter's coil is a valuable agent in allaying inflammatory symptoms about the mastoid process, but that its use should not be prolonged for more than forty-eight hours, provided no relief is given, or if the symptoms increase in intensity. After this period, if the parts are still tender to pressure, and swelling of the upper and posterior meatal wall near the attachment of the membrane is observed, accompanied by bulging of the membrana tympani, no further time should be lost in palliative measures.

Temperature is not a reliable index, for although it may rise if inflammation increases in adult cases and in chronic cases, the disease may be actively spreading without any such indication.

In opening the mastoid process we should not rest satisfied with merely opening the antrum, but should carry our investigation towards the mastoid apex, as frequently the cells here are affected, and if not cleared out the disease may extend into the deeper structures of the neck, and cause fatal complications.

W. Milligan.

Diseases of the Throat and Nose.

UNDER THE CHARGE OF A. HODGKINSON, M.B., B.Sc.

BARNICK (O.). "Larynx and trachea in leucæmia." *Münch. med. Wochensch*, 1898, Nos. 19 and 20.

VIRCHOW described as the first the presence of lymphoid nodules in the mucous membrance of the respiratory tract in leucæmia. They occur in the form of small, whitish, round intumescences, sometimes coalescing to larger infiltrations. Bamberger, Trousseau, and Mosler described cases of leucæmia in which a high degree of dyspnœa and cough formed the first symptoms of leucæmia. Well known is the diphtheriogangrenous affection of the mouth and pharynx in leucæmia.

The small lymphoid nodules were found by Virchow on the inner surface of the epiglottis, on the ary-epiglottid folds, and in the interior of the larynx and trachea. They lie mostly dispersed at some distance from one another, but sometimes they coalesce to a thick, homogeneous infiltration. The microscopic examination showed the connective tissue of the mucous membrane infiltrated with lymphoid nodules, having a great resemblance to miliary tubercles, but distinguished from these by the absence of fatty or caseous degeneration, by the rare occurrence of

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ulceration, and by the tendency to form extensive and diffuse infiltrations or larger, softish, and vascular nodes. Forster, Recklinghausen, and others confirmed Virchow's observations.

L. Ebstein described a case of leucæmia in which the laryngeal alterations became so extensive as to necessitate tracheotomy. At the post mortem both ary-epiglottid folds were found infiltrated, the ventricular bands were swollen, and showed several flat nodules, the vocal cords were converted into thickened roundish masses, showing a greyish red infiltration, the posterior wall of the larynx was slightly infiltrated, whilst the whole interior of the subcordal space was much swollen.

Barnick describes three cases.

The first is that of a boy, æt. 13. He had been under observation with the symptoms of leucæmia for a period of six months, when he was attacked by urgent dyspnœa, and the laryngoscopic examination showed a high degree of infiltration of the aditus laryngis, and particularly a thickening and swelling of the ventricular bands. This was verified by post-mortem examination. The microscopic examination showed the ciliary epithelium of the ventricular bands well preserved, between the epithelial cells some mononuclear leucocytes, these more abundant in the basal membrane. Below the epithelium were infiltrations of differing thickness, most extensive round the numerous vessels and around the mucous glands. In the sinus of Morgagni the subepithelial and submucous connective tissue was greatly infiltrated, the vessels dilated and surrounded with leucocytes. Similar alterations on the vocal cords, the epiglottis, etc. Here and there small hæmorrhagic foci were visible.

A second case was that of a girl, age 30, in whom there were apparently no laryngeal symptoms during life, but where post mortem a thickening of the laryngeal mucous membrane and a finely granular intumescence of the ventricular bands were found. There were also small leucæmic nodules on the glosso-epiglottid bands, in the ventricles, and in the interarytænoid space, all showing an adenoid structure.

A third case, that of a man, age 60, showed in the middle of the right vocal cord a hæmorrhagic ulcer, measuring 2—3 mm. The mucous membrane of the trachea showed numerous soft, white nodules of the sizes of 1—3 mm., some of them surrounded by a darker margin. The microscopic examination gave similar results to those in the other case.

GEYER (VON). "Laryngeal hæmorrhage."—*Munch. med. Wochensch.*, 1898, No. 15.

HÆMORRHAGE from the larynx may be caused by external or internal injury, by ulcerative processes, simple, carcinomatous, syphilitic, or

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tubercular; it may occur in hæmophilia, morb. Werlhofii, scurvy, hæmorrhagic smallpox, purpura rheumatica, leucæmia, pseudo-leucæmia, phosphorus-poisoning. In singers, after over-exertion and otherwise, a laryngitis hæmorrhagica has been observed, and hæmorrhages occurring at or in place of the menstrual periods have been described.

v. Geyer describes two cases in which laryngeal tumours were, the result of hæmorrhage. The first case was that of a woman, æt. 40, who suffered from repeated hæmoptysis, the lungs were found healthy, but a tumour the size of a grape was discovered fixed with a broad base at the petiolus of the epiglottis. The surface of the tumour was smooth, and partly covered with blood, the diagnosis was that of a "bleeding polypus." Interlaryngeal measures gave rise to hæmorrhage and urgent dyspnœa. The patient was, therefore, after a preliminary tracheotomy, subjected to subhyoid pharyngotomy, the tumour was shelled out, and the place of its insertion cauterised. Ten days after the operation hæmorrhage and the tumour had recurred. It was now recognised that the tumour simply consisted of a blood coagulum coming from a bleeding vein, which finally closed after repeated cauterisation. Microscopic examination of the original tumour showed that it was a partly organised blood-coagulum.

In a second case a tumour of the size of a hazel-nut was seen in the anterior commissure of the glottis; it arose with a broad base from the anterior part of the left vocal cord, and appeared to be a fibroma.

Removed with the cold snare, and microscopically examined, it was found to consist of an old hæmorrhagic coagulum, which had become partly organised, and was covered by mucous membrane.

A similar case was observed by Semon, and described by him in the *Archiv f. Laryngologie*, Vol. IV., p. 418. Here the tumour was infiltrating one vocal cord, and was thought to be carcinomatous. Laryngotomy was performed, and a simple hæmorrhagic infiltration, without any cystic wall, was found. *S. Moritz.*

Williams (P. W.): Bristol. "Remarks on rheumatic and gouty affections of the throat."—*The Laryngoscope*, April, 1898.

There are no characteristic features of rheumatic affections of the throat. A large proportion of cases of acute and chronic pharyngitis and laryngitis are of rheumatic origin. In the more acute cases the soft palate, pillars of the fauces, tonsils, and posteriopharyngeal wall are swollen and heightened in colour, and in some cases the uvula is œdematous and swollen. The large majority of cases of acute follicular tonsillitis are rheumatic. The other lymphoid tissue aggregations at the base of the tongue and in the nasopharynx are frequently similarly (and it may be

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independently) implicated. The author refers to Freudenthal's views in favour of rheumatic ulceration of the pharynx.

Rheumatic laryngitis is recognised by its association with rheumatism or with rheumatic tonsillitis and pharyngitis. It appears to have a tendency to affect the crico-arytenoid joints, and this is recognised by impaired movements of the cord or cords, and more or less fixation is apt to result. Before diagnosing rheumatic paralysis many other causes should be considered, especially as paresis or paralysis may be the only physical evidence of thoracic aneurism. The author believes in the microbic theory of rhematism, and that the micro-organisms are introduced into the body by inhalation, hence the frequency with which the pharynx suffers first, and bears the brunt of the infection.

Gouty disease of the throat is more common than rheumatic, because gout is a more chronic disease than rheumatism. Whereas rheumatic affections disappear spontaneously, gout, being a constitutional diathesis, the symptoms persist.

Acute gouty pharyngitis and tonsillitis are very painful, and, on swallowing, a sharp pain radiates to the ears. Morell Mackenzie observed in one patient acute pharyngitis alternating with gout in the right foot.

In acute gouty pharyngitis and laryngitis the affected parts are acutely inflamed and bright red. The pharynx appears gorged, congested, and glazed, and strikingly patchy. The uvula is sometimes much congested, swollen, or even œdematous. The tonsils do not suppurate. The pharynx is very irritable, and laryngeal examination is often impossible owing to retching, produced in spite of the use of cocaine.

Chronic gouty pharyngitis is characterised by thickening of the lateral walls, together with uneasiness or darting pain shooting up to the ears.

Very rarely, urate of soda deposits have been seen in the pharynx.

Chronic or sub-acute gouty laryngitis is characterised by constant and irritable cough, pain referred to laryngo-tracheal region, some external tenderness, the hawking up of a little sticky mucus occasionally streaked with blood, more or less hoarseness, and in severe cases disappearance of the voice. There is bright ingestion of cords, ventricular bands, and intra-arytenoid folds, in slight cases patchy, in severe cases diffused. Small tophi have been seen rarely. These, with accompanying thickening and inflammation, have been diagnosed as cancer. Laryngeal spasm is sometimes due to gout.

Treatment consists in the use of constitutional measures, these being enough without constant local applications.

Robert M. Fenn.

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Anatomy.

UNDER THE CHARGE OF ALFRED H. YOUNG, M.B., F.R.C.S.

EISLER (P.). "Zur Anatomie der Regio inguinalis des Weibes."—*Münch. med. Woch.*, April, 1898.

AFTER pointing out that the descriptions of the inguinal region of the female given in the various anatomical text books are not very precise, and certainly not so clear as they should be, considering the importance of the region in connection with operations for hernia and the shortening of the round ligament, Professor Eisler proceeds to give a detailed account of the anatomy of the part. As regards the size and position of the external abdominal ring, he finds that in the male its greatest diameter is 2 to 3 cm., and its centre is 4·5 to 5 cm. from the middle line; whilst in the female its diameter is only from 1 to 2 cm., and its central point is 3·5 to 4 cm. from the middle line. In both cases it is lateral to the pubic spine.

In the exposure of the external ring, by an incision running from the pubic spine towards the anterior superior spine of the ilium, a thick layer of adipose tissue is brought into view, immediately beneath the skin. The subjacent subcutaneous fascia is well developed, especially in women who have borne children, and occasionally it simulates the appearance of the aponeurosis of the external oblique, though in well-nourished persons it is separated from the latter by a thin layer of fat, and in ill-nourished and thin bodies it can be distinguished by the absence of the tendinous glistening which is so distinct when the aponeurosis is exposed. Some difficulty in displaying the ring is occasionally caused by Cooper's fascia, which passes from the margin of the external ring and gradually blends with the subcutaneous fascia. Cooper's fascia is a prolongation of the deep fascia covering the external oblique upon the funiculus; it is continuous above with the intercolumnar fibres from which it is prolonged downwards as a tubular sheath; on its dorsal aspect it is fused with the fascia covering the upper part of the adductor longus, whilst ventrally it soon becomes thinned out and unites with the subcutaneous fascia. When the labium is pulled outwards it is stretched, and can then be readily demonstrated and opened up.

The nearest blood vessel to the external ring is the superficial epigastric vein, which not uncommonly lies just external to it, and frequently receives a tributary from the lower and middle portion of the abdominal wall which passes directly above the upper part of the ring. The super-

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ficial epigastric artery lies external to the vein, and as a rule external to the position of the internal ring.

Professor Eisler denies the commonly-accepted statement that when Cooper's fascia is opened up, and the labium is pulled outwards, the fibre of the round ligament can be recognised passing into the labium; he says that such a statement is just as incorrect as the legend that the fibres of the gubernaculum testis in the male are attached to the bottom of the scrotum. In the female those fibres of the round ligament which pass through the external abdominal ring are attached to the front of the symphysis, and when Cooper's fascia is opened the first thing recognisable is the ilio-inguinal nerve; beneath this is a thin fascia derived from the lower border of the internal oblique, covering the cremaster muscle, and a superficial branch of the genito-crural nerve. If the loose tissue inside the internal oblique fascia is opened up, a larger branch of the genito-crural nerve and the cremasteric artery will be found in its dorsal part, and when these are pushed aside a small vein and the round ligament alone remain; the vein communicates externally with the superficial external pudic vein, and is continued internally in the substance of the round ligament, from which it cannot be isolated. During an operation, the extra-annular part of the ligament should not be pulled upon before the part in the canal has been loosened from its connections by a sound, and even then if no distinct cord can be demonstrated, the ventral wall of the canal should be opened up and the cremaster pushed aside, when, in favourable cases, the ligament may be recognised as a pale red or whitish cord, 3 to 4 mm. thick, which, if pulled upon, draws down a process of peritoneum into the canal.

In the concluding part of his paper Professor Eisler draws attention to certain points of strength, structure, and ordinary function which have a direct bearing upon the probability of a successful issue to an operation which deals with the round ligament.

The weight which produces tearing of the ligament is variously stated. Beurnier puts it at 500—600 grms., Polk at $2\frac{1}{4}$—$2\frac{1}{2}$ kilos., and Lanz at 5—$5\frac{1}{2}$ kilos. Probably the great difference between the results is due to the fact that Polk and Lanz did not separate the ligament from its peritoneal attachments.

As a general rule the intra-abdominal portion of the round ligament alone contains muscular fibres, and is well developed. The part in the inguinal canal is reduced to strands of fibrous tissue, and outside the external ring these are diminished in number and strength.

It is believed that the function of the ligament is to retain the uterus in a state of normal anteflexion, and if the abdomen is opened, and the uterus pushed backwards, the ligament is rendered tense. A similar tension is produced by distension of the bladder, and it is pro-

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bable that the alternating tension and relaxation are the factors which prevent the atrophy of the intra-abdominal part of the ligament, for it is known that in the case of ordinary ligaments continuous extension or relaxation leads to atrophy, for the necessary resting phases, during which reconstruction can occur, are absent, and presumably the same is the case with the round ligament, for the inguinal part which undergoes no strain atrophies and the abdominal part retains a certain amount of substance and strength. Obviously, if this is the case, then, after any operation in which the ligament is shortened, the uterus must be supported, or the continual strain thrown on the ligament will result in its atrophy. Professor Eisler thinks that the best chance of a favourable result is increased if pregnancy follows quickly after the operation, and produces a normal hypertrophy of the shortened band.

FREDET (P.). "Quelques recherches sur les artères de l'uterus."—*Journal de l'Anatomie et de la Physiologie*, 1898, No. 1.

FREDET'S observations, which were made on two new-born children and twelve adults, serve to confirm the statements made by previous observers that the uterine arteries supply the whole of the uterus, the upper part of the vagina, and the inner part of the ovary. It is only occasionally that the ovarian artery passes the ovary and supplies the upper part of the uterine wall. The main interest, however, of Fredet's researches lies not so much in the confirmation which they afford to the assertions of some of his predecessors, as in the basis which they form for the better understanding of the exact course of the uterine arteries. There is a general belief that the uterine artery on each side runs inward from the side wall of the pelvis, in the base of the broad ligament, until it reaches the upper part of the vagina where it turns upwards along the lateral border of the uterus, and Fredet points out that this is not the case; the uterine artery does not enter the broad ligament till it is close to the neck of the uterus. It springs either directly from the internal iliac artery or from the root of the hypogastric artery, and passes downwards beneath the peritoneum on the floor of the ovarian pouch, in front of the ureter; from the lower margin of the ovarian pouch it is continued forwards and inwards, in a fold of peritoneum, which lies between the back of the broad ligament and the recto-uterine fold, until it approaches the neck of the uterus, when it enters the base of the broad ligament and turns inwards to the uterus, passing above and in front of the ureter which is continued forward beneath it to the base of the bladder.

For operative purposes the uterine artery may be approached from the lateral fornix of the vagina, but if it is ligatured close to the neck of

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the uterus, the branches it gives to the vaginal wall will lie on the proximal side of the ligature. During an intra-abdominal operation it may be easily secured by taking the ureter as a guide, as it lies in the posterior boundary of the ovarian fossa. *Arthur Robinson.*

Anile (Antonio). "Di un' importante anomalia artero-nervosa (arteria succlavia di destra e nervo laringeo inferiore corrispondente)."—*La Riforma Medica*, May 13, 1898.

In describing an example of abnormal origin and course of the right subclavian artery Dr. Anile points out that numerous cases are recorded in which the right subclavian artery rises from the aorta beyond the left subclavian trunk. Indeed, according to the comparatively recent statistics published by Beisso and Giura, this condition is met with in 1 per cent of all cases. It is of interest not only from an anatomical point of view but also from a clinical, inasmuch as the abnormal right subclavian artery in its course to the interspace between the right middle and anterior scalene muscles passes behind, or in front of, the œsophagus, and may possibly compress it. As long ago as 1789, Bayford associated a special form of dysphagia, which he called dysphagia lusoria, with the presence of the abnormal artery; but more recently Fleischmann, Frandsen, and Calori have opposed Bayford's opinion, and Hyrtl suggested that dysphagia was only produced when the abnormal artery had undergone aneurismal dilatation; but Zoia has described the case of a beggar who suffered from intermittent dysphagia in whose body the abnormal artery was found. Some authors have suggested that the condition is associated with a smaller development of the right artery and the habitual use of the left hand; but this suggestion, in Dr. Anile's opinion, is not supported by the recorded cases. The anatomical relations, however, lend some support to the view that dysphagia may possibly be caused by the abnormal artery, especially when it passes behind the œsophagus at the level of the second or third dorsal vertebra, for at this point the vertebral column is still convex anteriorly, and may press the artery against the left bronchial tube. In this connection a case of some interest is recorded by Dubreil. A woman who had bolted a mass of food died suddenly, and at the post-mortem examination a spicule of bone, embedded in the food, was found projecting through the wall of the œsophagus and penetrating the abnormal right subclavian artery, which was passing upwards between the aorta and the vertebral column.

Another point of anatomical interest met with in cases of the low origin of the right subclavian artery is the absence of a right recurrent laryngeal nerve; the nerve fibres for the intrinsic muscles of the larynx

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leaving the vagus at or about the level of the lower border of the larynx; this associated abnormality has not been noted by all the authors who have described cases of the abnormal artery. It was first pointed out by Stedmann, and was afterwards noted by Demarquay, Turner, Calori, Zoia, and by Beisso and Giura.

In the case which came under Dr. Anile's notice the heart was larger than normal, the root of the ascending aorta was enormously dilated and affected with atheroma. The transverse aorta had the normal obliquity and terminated at the level of the third dorsal vertebra; it diminished gradually during its course, and assumed the form of a much elongated cone, curved with the convexity upwards. It gave origin from before backwards to the right common carotid, the left common carotid, the left subclavian and the right subclavian arteries. The distance between the origins of the two carotids was ·5 cm.; between the left carotid and the left subclavian 1 cm., and between the left and right subclavians 2 cm. The origin of the last branch was about the same distance from the commencement of the descending aorta; it ran upwards, and to the right between the œsophagus and the vertebral column, opposite the second dorsal vertebra, to the space between the anterior and middle scalenes on the right side, and it made a distinct impression on the œsophagus. Before passing between the scalenes it gave off the ordinary branches of the first part, but it had no relation with a recurrent laryngeal nerve; the fibres representing that nerve passed directly from the trunk of the vagus to the inferior part of the larynx, and œsophageal and tracheal branches which ordinarily rise from the recurrent laryngeal nerve were given off from the vagus trunk. The left recurrent nerve had the usual relation to the aortic arch.

Dr. Anile ascribes the occurrence of this anomaly, in the usual way, to the disappearance of the fourth aortic arch and the persistence of the right root of the descending aorta, and he does not fail to note that there is no satisfactory explanation either of the cause of this alteration of normal development, or of the peculiar course which the abnormal right subclavian artery occasionally takes when it passes either between the trachea and œsophagus or in front of the trachea; but he suggests the peculiarity of course may be due to the existence of arterial anastomoses between the various arches, some of the anastomosing channels passing between the trachea and œsophagus and others in front of the trachea.

The absence of the recurrent laryngeal nerve is obviously due to the disappearance of the fourth right aortic arch round which it normally passes, and by which it is drawn down as the heart and great vessels descend from the neck towards the thorax, for in those cases in which the right subclavian artery arises as the last branch of the arch of the

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aorta, on account of the persistence of the right root of the descending aorta, and the right fourth aortic arch also remains, and is continued directly into the vertebral artery, the recurrent laryngeal nerve turns round the root of the latter vessel.

Pathology and Bacteriology.

UNDER THE CHARGE OF A. SHERIDAN DELÉPINE, M.B., B.Sc.

GAYLORD (H. R.). "Fibrinous exudates and fibrinoid degeneration." *Journal of Experimental Medicine*, 1898, Vol. III., p. 1.

THE histogenesis of the fibrinous masses met with on inflamed serous membranes has always been a subject of much controversy and divergence of interpretation. To Cohnheim, and such of his followers as Wagner, Weigert, and Orth, fibrin was but a manifestation of exudation and coagulation, whilst to Rokitansky, Virchow, Buhl, and Neumann, it was the product, either wholly or in part, of a degenerative change affecting the subendothelial connective tissue ("Desmoider Faserstoff" of Buhl).

Thus, Neumann regarded the fibrinous products of tuberculous inflammation and the deeper parts of the fibrinous layer of acute pleuritis and acute purulent peritonitis as the results of a fibrinoid degeneration of connective tissue, whilst in acute cases free from connective tissue proliferation, he considered the fibrin as originating by exudation and coagulation.

More recently, many other investigators have taken sides with one or other of the two extreme schools of opinion, or, as Apel, have supported the intermediate position taken up by Neumann.

The latter, in reply to a criticism by Marchand, has recently reiterated his position. By fibrinoid degeneration Neumann comprehends a change whereby the connective tissue bundles become swollen and homogeneous, and later become transformed into a substance identical in all respects with fibrin obtained from blood.

The process is to be seen typically in the inflamed pleura, overlying portions of hepatized lung, where the existence of a continuous epithelial layer over the fibrin, and the absence of a distinct demarcation between it and the subjacent connective tissue during the early stages, are definite indications of its origin from the subendothelial connective tissue.

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Neumann and Buhl recognised the importance of the outer elastic lamina as indicating the extent to which the fibrinoid degeneration might proceed.

In a number of inflamed serous membranes which he examined, Gaylord was quite unable to find any evidence in support of the degeneration theory, but, on the other hand, there was much to the contrary.

In simple and septic inflammations of the pleura and pericardium he found the epithelial layer beneath the masses of fibrin in a good state of preservation in recent conditions, and that the extent of the layer quite precluded the possibility suggested by Neumann that epithelium in such situation might be that of a lymphatic. Again, in more advanced conditions, in which this epithelial layer was no longer demonstrable, he found the fibrin invariably occupied a position superficial to the elastic lamina, and in the majority of cases a distinct layer of connective tissue separated the two structures.

As the result of a number of experiments on animals, Gaylord found that when fibrin, as such, or some fibrin-forming fluid, was introduced into serous cavities, the fibrin became adherent to the serous membrane. After some days, proliferation of the serous epithelium occurred, particularly at the margin of the adherent mass, and after six days completely invested it with a continuous epithelial layer. The epithelium immediately under the fibrinous mass also remained intact.

Following these proliferative changes, organisation occurred in the usual fashion, and in the first instance was confined to a layer of fibrin immediately beneath the proliferating epithelium. During the process of organisation masses of fibrin showed a tendency to become isolated and assume a hyaline character. Again, when the fibrin resulted from the coagulation of some fluid containing cells, the latter were frequently arranged in rows. It would appear then, from such results as the above, that neither the relation of the epithelium (Neumann), the occurrence of hyaline masses (Neumann), nor the arrangement of the cells in the fibrin (Neumann, Grawitz, etc.) are indications of fibrinoid degeneration, but may obtain during the organisation of a mass of fibrin introduced from without.

In the fine, closely adherent fibrinous masses met with on the pleura over affected portions of tuberculous lungs, the appearances are very different.

The intimate adhesion of the fine strands of fibrin to the connective tissue, and their diverse distribution between the fibres of the latter, suggest that the fibrin may possibly originate as a fibrinoid degeneration of the connective tissue. Still, as Orth has asserted—"No definite position can be taken on this question until the fibrinous masses can be demonstrated under the elastica."

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Gaylord did not succeed in any case in demonstrating the fibrin subjacent to the elastica, and until the advocates of the theory of fibrinoid degeneration can establish this point, the question of the true nature of tuberculous cases must remain in doubt.

ADAMI (J. G.). "The great omentum."—*Philadelphia Medical Journal*, 1898, Vol. I., p. 373.

PATHOLOGICAL conditions of the great omentum have received but scanty notice in modern literature. The results of observations of the condition of this organ in 150 consecutive autopsies cannot therefore fail either in interest or value.

Although in size it presents great variations, it would appear from Adami's observations that it is not quite so variable as one is apt to regard it. The impression that the omentum is inconsiderable in size is in many cases due to ravelling of the delicate membrane. Thus, in the 150 cases it was found: Coiled under the transverse colon, 10 cases; coiled under the stomach, 1 case; coiled in front of and above the transverse colon, 5 cases; coiled and lying over the transverse colon to the left, 2 cases; passing up over the liver, without adhesions, 2 cases; passing up under the liver, 1 case; the frequency of this coiling up of the omentum, as found in the post-mortem room, being, as McLeod has already suggested, probably associated with long continuance in the supine position ante mortem.

On the other hand, increase in size of the omentum may again be more apparent than real, as in cases where the stomach is large and distended. Apart from such apparent variations, however, there are real variations of considerable extent. In two cases—both old men—the omentum was only an inch and a half across; and in a third case, a phthisical patient, æt. 26, it was represented by "three tags of delicate reticulated membrane." In none of the 150 cases, however, was it completely absent.

Whatever may be the importance of the structure as a protective "apron," or in the development of ascites, it certainly plays a very important part in inflammations of the abdominal viscera, as is indicated by the frequency of its attachments and the rapidity with which it appears to apply itself to an inflamed area, and become adherent by plastic or later fibroid adhesions.

In the autopsies referred to, which were on subjects of all ages, the following adhesions were noted:—

Abdominal Walls.—Generalised adhesions: plastic or fibroid in 8 cases of recent or old generalised peritonitis. Localised adhesions: In

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the middle line below the umbilicus, or in the right inguinal region, in 6 cases; along the pubic crest in 2 cases of generalised tuberculosis; in the left flank in 4 cases; in the right flank over the ascending colon in 2 cases; to the subcostal parietal peritoneum in 2 cases; incarcerated in umbilical hernia in 3 cases; to a secondary cancer nodule at the umbilicus in 1 case; along the right inguinal canal, and to the testis in 1 case; to the posterior aspect of the abdominal wall, near the root of mesentery in 1 case; to the pelvic wall, forming the roof of a localised pelvic abscess in 1 case.

Liver.—In 4 cases: 1 case of atrophic cirrhosis; 1 case of old hydatid cyst communicating with adherent hepatic flexure; 2 cases of multiple pyæmic abscesses.

Ovary.—In 1 case of chronic oöphoritis.

Uterus.—In 3 cases: 1 case, several adhesions to fundus; 2 cases to stump after hysterectomy.

Stomach.—1 case of perforated gastric ulcer, operated on 9½ hours before death.

Small Intestines.—In 5 cases: 2 cases of general peritonitis; 1 case of traumatic rupture of the jejunum; 1 case of resection of part of ileum; 1 case of healed intussusception.

Appendix.—In 4 cases: plastic adhesions forming portions of walls around abscesses.

Colon.—In 2 cases: adhesions to the sigmoid flexure.

Rectum.—In 2 cases: 1 case of plastic adhesions to first part of rectum after removal of a parovarian cyst and pelvic abscess; 1 case of chronic adhesions in pernicious anæmia with evidence of chronic peritonitis, possibly tuberculous.

Although there were so many instances amongst these 150 consecutive autopsies in which localised abdominal inflammation had been followed by omental adhesions, still there remained many cases in which no such adhesions were found, although similar lesions of various organs had been present.

It would appear that omental adhesions depend for their existence on (1) the quality of the inflammation, thus where serous rather than fibrinous exudation obtains there may be no adhesions; (2) the great vascularity of the omentum, rendering it capable of extremely rapid reaction to irritation; and (3) the constant shifting of its position, or its peculiar liability to roll about in cases of abdominal disturbance.

F. C. Moore.

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FERRÉ. "La toxine diphtérique aviaire."—*Journal de Médecine de Bordeaux*, 3 Avril, 1898.

THE author showed, at a meeting of the Society of Anatomy and Physiology of Bordeaux, on March 7 last, some examples of paralysis in the barn-door fowl, following the injection of the toxine of Loeffler's bacillus from avian diphtheria. In this paper the author summarises the results of his investigations. The toxine was prepared from a culture a month old, in 2 per cent peptone bouillon; this was filtered through a Chamberland filter, and the resulting filtrate used for the experiments. In all, 22 fowls were inoculated and paralysis produced. The effects varied with the quantity of toxine injected, with the age of the culture, and with the duration of exposure to light and air. In doses of from 0·2 to 0·25 cc. transitory paralysis was usually produced in medium-sized fowls, but in some cases death ensued. In doses of 0·4 cc. progressive paralysis and death invariably resulted in from four to eight days. With the larger doses local symptoms (œdema, extravasation of blood) were usually produced, followed by paralysis, beginning in the nearest muscles. When the injection was made in the interscapular region the muscles of the neck were affected, and in severe cases the muscles of deglutition also. In some cases contractures were produced, giving rise, in the case of the muscles of the neck, to torticollis; in some cases also the two sides of the body were unequally affected with hemiplegia. If the dose is sufficient, the paralysis extends to all four limbs, ultimately respiratory paralysis and death ensuing. Alterations of sensibility were noticed in the feet in some cases, and trophic changes were observed in a few cases; diarrhœa and marked wasting results in advanced stages, with respiratory paralysis and death.

After death, the kidneys were found congested, the liver pale and yellow, and the heart muscle pale; the nerves showed apparently no change, but on microscopic examination characteristic changes were found. The sciatic nerves and nerves of the brachial plexus showed well-marked neuritis; in the spinal cord poliomyelitis, vascular dilatation, with hæmorrhages in certain places, were found, the nerve cells of both the anterior and posterior cornua showing marked degeneration.

Some experimental investigations were further made by the author to determine whether the toxine acted primarily on the spinal cord or on the nerves. Two experiments were made, the toxine being injected directly into a vein in each case. The fowl was in each case killed in an early stage of paralysis, and in each marked changes were found in the cord, the sciatic nerves showing little or no change in either instance.

A. E. Brindley.

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LUNT (JOSEPH). "On a convenient method of preserving living pure cultivations of water bacteria, and on their multiplication in sterilised water."—*Transactions of the British Institute of Preventive Medicine*, 1897.

A DIFFICULTY in bacteriological laboratories is to keep the different species of bacteria alive and to preserve them with their original character, as it is found that an organism when cultivated on an artificial soil is apt to lose some of the characters that distinguished it when it was freshly isolated from its native habitat. The water bacteria may be conveniently grown in sterilised tap water, when they will retain their vitality for a long time, and sub-cultures on gelatine plates or other media will show the characters that were observed when the organisms were freshly isolated. This method of cultivation also serves to distinguish the water bacteria proper, as other organisms do not find in water the nutritive material necessary for their long continued growth.

Experiments were made with seven species of water bacteria. The bacillus fluorescens liquefaciens was grown in flasks of sterile distilled water, London tap water and London sewage, and in each case it was found to be alive at the end of two years, a single loopful of the water giving numerous colonies when smeared on the surface of agar. In the tap water the rate of multiplication was very large, and serves to show the enormous capacity for supporting bacterial life possessed by comparatively pure drinking water.

Somewhat similar results were obtained in the other cases, the organisms being found to exist in large numbers at periods varying from seven months to two years, and to retain their characters unchanged.

The bacillus coli communis, grown in sterilised tap water, did not increase in numbers, and at the end of five months there was a marked decrease, but the colonies obtained were normal in character, and there was no alteration in the reactions of the bacilli.

The paper gives tables showing the results of exact quantitative experiments as to the capacity for multiplication in sterilised water possessed by the species examined. *E. J. Sidebotham.*

STILL (G. F.). "The bacteriology of the simple posterior basic meningitis of infants."—*The Journal of Pathology and Bacteriology*, May, 1898. Vol. V., No. 2, pp. 147—159.

THROUGH the researches of Barlow, Gee, Lees, Carr, and other workers at the Great Ormond Street Hospital for Sick Children, simple posterior basic meningitis of infancy has been firmly established as a definite clinical entity.

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Dr. Still has also shown that it has a quite characteristic morbid anatomy. The author now publishes the results of his investigation into its ætiology, and arrives at the following conclusions:—

(1) The disease of infancy, recently described as simple or non-tuberculous posterior basic meningitis, is a specific disease, due always and only to a particular micro-organism.

(2) The micro-organism which is the cause of this disease is a diplococcus, which is almost identical with the diplococcus described by Weichselbaum and Jaeger. It presents, however, some slight differences, which are probably to be accounted for by natural variation.

(3) The simple posterior basic meningitis of infants must, on bacteriological evidence, be considered as a sporadic form of the disease known as epidemic cerebro-spinal meningitis, the *D. intra-cellularis* having been shown by recent observers to be the cause of some, at least, of the epidemics of that disease.

(4) The peri-arthritis, which occasionally complicates the simple posterior basic meningitis of infants, is due to the same diplococcus that is found in the meningeal exudation. *T. N. Kelynack.*

Reviews.

"A Handbook of Therapeutics." By Sydney Ringer, M.D., F.R.S., and Harrington Sainsbury, M.D., F.R.C.P. London: H. K. Lewis. 1897.

This book has now reached its thirteenth edition, and whilst it is kept so well abreast with therapeutic progress its popularity is sure to continue. With each edition it becomes more adapted to the wants of the busy practitioner, for, as the authors specially point out, they continue purposely to dwell on the use of drugs rather than their action. Nevertheless the relation between the therapeutic use of drugs and the method of their action is by no means ignored.

Several instances find place in the present edition which were not alluded to in the last. Amongst them may be mentioned antifibrin, carbonic acid, agaricus, chloralamide, and sulphonal.

The point most worthy of notice in the new edition is the chapter on serum therapeutics. In introducing this subject, the authors point out that serum treatment involves a new departure, but no break with the old methods. It depends "not upon any new principle of application, but on a more intimate knowledge of the chemistry of tissues and the vital processes of the lower forms of life." After general discussion of the principles of serum thera-

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peutics, the practical application of the most important antitoxins are described, beginning with diphtheritic serum. No attempt is made to describe the method in which the serum is obtained. But its method of use and its effects are described clearly. The serum treatment of glanders, cholera, hydrophobia, tentanus, and snake-bite are briefly alluded to, but the failures and successes of the antistreptococcus serum are more fully discussed, without however any definite view being expressed as to the position which this treatment is likely to hold. Treatment by tuberculin is very summarily dismissed, whilst thyroid medication receives ample notice. The use of thymus gland, the supra-renal bodies, bone, marrow, and a few other animal substances, are briefly noticed, but concerning others, such as dried kidney, liver, spleen, etc., the reader is merely referred to "Martindale's Extra Pharmacopœia" and "Merck's Annual Reports."

In the chapter on the dietary of invalids the digestive ferments receive fuller notice than in previous editions, the uses of taka-diastase, maltine, pancreatine, papaine being pointed out. Mention is made of several well-known diets, and that advocated by Dr. Salisbury receives a full notice.

Practitioners will continue to find this handbook of therapeutics a most useful aid in practice.

"Lectures on the Action of Medicines." By T. Lauder Brunton, M.D., D.Sc., LL.D., F.R.S. London: Macmillan and Co. 1897.

Dr. Brunton's book on the action of medicines differs in its aims from almost all other works on the subject. It is not meant specially for medical practitioners, for useful though it may be found by them in many respects, it does not by any means give a full account of the purposes for which remedies may be applied. Nor is it intended for a students' text-book, in the sense, at least, of preparing for examinations. The author says in the preface that any one who tries to pass an examination upon the lectures alone will not be at all likely to get the maximum number of marks. The aim of the book is to awaken the attention of the student, to excite his interest, and to make him think; to lay the foundation of knowledge, rather than to attempt to complete the structure, and for these purposes it is admirably adapted. Even though it has not been written specially for the benefit of medical practitioners, it will be found by them a work of no slight utility, since it gives explanations for many of the therapeutic actions of drugs difficult to comprehend, and is full of practical suggestions of a most useful kind. It is essentially a readable book, and this cannot be said of most books on pharmacology and therapeutics. The

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pleasant manner in which it is written is largely due to the fact that it is not moulded on hard and fast lines; the author makes central points of important physiological facts bearing on the action of medicines, and then branches off to practical matters which are the outcome of these facts. An account of the nature of cells, protoplasm, and albumen leads to remarks on drugs and dosage, and these, again, to a note on homeopathy, whilst the section on ptomaines and leucomaines concludes with useful remarks concerning the mortality which may be caused by want of proper care in the use of the feeding bottle.

In these lectures, as in all Dr. Brunton's works, will be found a freshness in the treatment of the subjects he deals with and an originality which command attention and fix facts on the memory. His facts and the resultant hypotheses awaken thought, even when the latter seem somewhat doubtful. It seems very problematical that mania e potu is the outcome, as he suggests, of the presence of furfur-aldehyde in alcoholic potations, but his note of the effects of furfur-compounds on dogs is highly interesting, and points to the necessity for further attention to the by-products developed during the manufacture of alcoholic drinks.

The lecture on chloroform is especially interesting, since we have set forth the views of one of the ablest opponents of the view that chloroform, when given for anæsthetic purposes, is apt to cause death by its action on the heart.

Dr. Brunton stoutly maintains the view he was led to form from the experiments at Hyderabad, that in giving chloroform to produce anæsthesia danger primarily arises from its effects on the respiration. He has no doubt that in 99,999 cases out of 100,000 it causes the respiration to fail before it affects the heart if the respiration be carefully attended to, but chloroform is a protoplasmic poison, and will kill the heart; only in ordinary chloroform inhalation, he holds, it does not paralyse the heart as soon as the respiration. He by no means expresses the extreme views of Laurie with regard to the practical use of chloroform. If the choice were to be between watching the heart and the respiration he would choose the former, but he has no objection to both provided that attention to the pulse does not take away from attention to the respiration: "If anything goes wrong with the pulse the finger informs them that some accident is occurring, and double attention is immediately excited."

The remarks on hypnotism are well worthy the attention of students, giving, as they do, the explanation of the phenomena observed.

But the whole book is full of interesting observations and sugges-

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tions. It is an excellent work with which the student may commence his acquirement of pharmacological and therapeutical knowledge, though he will require to read also more formal treatises. It is an excellent book for the practitioner, for it will constantly suggest remedial agents founded on pharmacological grounds.

"Inflammation of the Bladder and Urinary Fever." By C. MANSELL MOULLIN, M.D. (Oxon.), F.R.C.S. London: H. K. Lewis. 1898.

THE author explains in his preface that the object of this work is to show that inflammation of the bladder is always due to micro-organisms, which, in the vast majority of instances, have invaded it from without; and, believing that this fact is not generally recognised, he is of opinion that the principles of aseptic surgery still require an advocate when the bladder is concerned.

He shows that while normal urine obtained directly from a healthy bladder is sterile, in suppurative cystitis it always contains pyogenic cocci or bacteria, the bacterium coli being the one which is most commonly present. Attention is also directed to the fact that micro-organisms may be present in the urine without exciting any inflammation so long as the bladder is healthy and uninjured—as in cases of bacteriuria—and retention of urine may continue for years and never cause any inflammation. But if the two conditions occur together, *i.e.*, if there is retention of urine and micro-organisms gain entrance to the bladder through a septic catheter or in any other way, then suppurative cystitis always follows. He is of opinion that urinary fever is a form of septic poisoning, due to the entrance into the circulation either of micro-organisms or their products, which are present in the urine or in the walls of the urinary passages; and while admitting that it is more liable to occur in those whose kidneys are diseased than in those in whom they are sound, he is opposed to the view that this condition is in any way dependent upon lesions of the kidney, whether functional and transitory or organic, and he will not, therefore, allow that there is any direct connection between renal disease and septic infection. Holding these views, great importance is laid upon the thorough sterilisation of all instruments, especially catheters, before their introduction into the bladder, and elaborate directions are given for rendering them aseptic.

A chapter is devoted to the treatment of tuberculous cystitis, and in its incipient stage the author attaches the greatest importance to constitutional measures, not so much to cod-liver oil and iron—though these in their way are beneficial—as to sea-air. Internal antiseptics are of little use, and local medication does more harm than good as

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a general rule, on account of the risk of introducing pyogenic organisms and setting up a septic cystitis. In cases where the disease primarily attacks and is limited to the bladder, he states that good results may be obtained by scraping with a curette, through a suprapubic opening, any patches of ulceration which are present, and then applying a strong solution of chloride of zinc or a Paquelin's cautery, and cases are quoted where, as the result of this treatment, the bladder symptoms disappeared, and had not recurred several years after operation.

The work, which is a very valuable contribution to the surgery of the bladder, will well repay perusal, for it contains much useful information and many practical hints, which will be found of great service in the treatment of the diseases of which it treats; and no one can study it without being forcibly impressed with the necessity for the employment of the most careful antiseptic precautions in this branch of surgical practice.

"A Synopsis of the British Pharmacopœia, 1898." Compiled by H. Wippell Gadd. London: Baillière, Tindall, and Cox. 1898.

This is a handy little volume suitable for the pocket, and contains, in a convenient form, a large amount of information respecting the new Pharmacopœia and the differences between it and the 1885 edition.

Tables are first given containing the additions, omissions, and principal alterations, strengths of the alcoholic solvents, and the preparations made with each strength. There are also at the end tables of weights and measures, the symbols and atomic weights of the elements, the thermometric scales, and the official directions for the preparation of tinctures.

The bulk of the volume consists of a synopsis of the new Pharmacopœia arranged in a tabular form, in which the name, formula, dose in both imperial and metric systems, and strength of each drug and preparation is given.

In a work of this kind, intended for constant reference, accuracy is of the greatest importance, and it is to be regretted that so large a number of errors have been allowed to creep in. This is especially noticeable in the lists of preparations and strengths. For example, on page 67 the Lamella cocainæ is given as containing $\frac{1}{200}$ of a grain instead of $\frac{1}{50}$, and the lozenge with krameria is omitted from the list of preparations; on page 71 the infusion of digitalis is given as 1 in 20 instead of 1 in 160; page 109, the two lozenges are omitted from the preparations of morphinæ hydrochloride; and on page 119 the strength of pil. saponis co. is given as 1 in 6 instead of 1 in 5 of opium. The list of preparations

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of some important drugs, such as aconite, gelsemium, and strophanthus, are not given at all, and some of the other drugs have an incomplete list.

With careful revision in future editions this synopsis will be very useful to students of materia medica and others who wish to have a handy account of the British Pharmacopœia, 1898.

PUBLICATIONS RECEIVED.

From Messrs. Macmillan and Co., London :—

"System of Medicine," Vol. V. (25s.) Edited by T. CLIFFORD ALLBUTT, M.A., M.D., LL.D., F.R.C.P., F.R.S., F.L.S., F.S.A.

From John Wright and Co, Bristol :—

"Rheumatoid Arthritis; its Pathology, Morbid Anatomy, and Treatment." Second Edition. (7s. 6d.) By GILBERT A. BANNATYNE, M.D., M.R.C.P.Edin.

From H. K. Lewis, London :—

"Textbook of Diseases of the Kidneys and Genito-Urinary Organs," Vol. II. (10s. 6d.). By Professor PAUL FÜRBRINGER. Translated by W. H. GILBERT, M.D.

From Messrs. Longman, Green, and Co., London :—

"Comfort and Cleanliness; the Servant and Mistress Question." (2s.) By Mrs. CATHERINE M. BUCKTON.

From Messrs. Kegan Paul, Trench, Trübner, and Co., London :—

"B. BRADSHAW'S Dictionary of Bathing Places, Climatic Health Resorts, Mineral Waters, Sea Baths, and Hydropathic Establishments." (2s. 6d.)

From Messrs. Ballière, Tindall, and Co., London :—

"From our Dead Selves to Higher Things." (3s. 6d.) By FREDK. JAMES GANT, F.R.C.S.

From Evans, Gadd, and Co., Exeter :—

"A Synopsis of the British Pharmacopœia of 1898." (1s.)

From the Rebman Publishing Co., London :—

"Archives of the Röntgen Ray." (4s.) May, 1898.

From Charles Griffin and Co., London :—

Year Book of the Scientific and Learned Societies of Great Britain and Ireland. Fifteenth Annual Issue. (7s. 6d.)

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From Young J. Pentland, Edinburgh:—

"Renal Growths; their Pathology, Diagnosis, and Treatment." By By T. N. KELYNACK, M.D., M.R.C.P.

"Edinburgh Medical Journal." New Series. Vol. III.

From H. K. Lewis, London:—

"The Extra Pharmacopœia." Ninth Edition. (10s. 6d.) By WILLIAM MARTINDALE, F.L.S., F.C.S., and W. WYNN WESTCOTT, M.B., Lond.

From J. and A. Churchill, London:—

"The Mental Affections of Children—Idiocy, Imbecility, and Insanity." By W. W. IRELAND, M.D.Edin.

Local News.

UNIVERSITY OF LONDON.

The following Professors of the Owens College have been appointed Examiners for the University of London:—

Professor S. ALEXANDER, in Mental Physiology.

Professor D. J. LEECH, in Materia Medica and Therapeutics.

Professor J. DIXON MANN, in Forensic Medicine.

Professor A. H. YOUNG, in Anatomy.

THE VICTORIA UNIVERSITY.

The following have been recommended for the degree of M.D.:—

W. C. T. BROWN ..... *Owens.*
F. J. H. COUTTS..... ..... *Owens.*
J. S. DOCKRAY ..... *Owens.*
F. C. MOORE ..... *Owens.*

Gold medals have been awarded to F. J. H. COUTTS and F. C. MOORE.

APPOINTMENTS.

BOWDEN, W. J., M.B., Ch.B. (Vict.), has been appointed Medical Officer for the Glossop Union Infirmary.

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CHRISTOPHER, S. R., M.B., Ch.B. (Vict.), has been appointed Assistant Medical Officer of the Mill Road Infirmary of the West Derby Union.

CROMPTON, H. J., M.B., Ch.B. (Vict.), has been appointed House Physician to the Royal Infirmary, Manchester.

GARFIT, C. C., M.B., Ch.B. (Vict.), has been appointed Medical Officer for the Glenfield district of the Blaby Union.

KELSALL, R., M.B., Ch.B. (Vict.), has been appointed House Surgeon to the Royal Infirmary, Manchester.

MELLAND, C. H., M.B. (Lond.), M.R.C.S., L.R.C.P., has been appointed Resident Medical Officer to the City of London Hospital for Diseases of the Chest.

PRESTWICH, J., M.B., Ch.B. (Vict.), has been appointed Assistant House Surgeon to the Nottingham General Hospital.

STONEY, W. W., M.D., Ch.B. (Vict.), has been appointed Medical Officer of Health for the towns of Kimberley and Beaconsfield.

TAYLOR, FRANK E., M.A., B.Sc., Ch.B. (Vict.), M.R.C.S., L.R.C.P. Lond., has been appointed House Surgeon to the Hospital for Women and Children at Leeds.

WYLIE, D. S., M.B., Ch.B. (Vict.), has been appointed House Surgeon to the Royal Infirmary, Manchester.

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THE MEDICAL CHRONICLE:

A MONTHLY RECORD OF THE

Progress of Medical Science.

THE TYPHOID BACILLUS AND ITS PRESENCE IN THE EXCRETA.*

By J. R. CARVER, M.D. (Cantab.).

No one can fail to notice a considerable divergence of views held by various observers regarding the presence of typical typhoid bacilli in the fæces and urine of typhoid patients, and I have made a series of observations on this question with the view of supplying additional evidence on the subject, and possibly some explanation of the apparent disagreement of authors.

The subject was suggested to me by Professor Delépine, and the investigations have been conducted in the Bacteriological Laboratory, Owens College. Most of the material was obtained from the Monsall Fever Hospital, and I have to acknowledge the courtesy with which Dr. Marsden gave me access to patients and material in that hospital.

From the nature of its symptoms, enteric fever has long been thought a specific disease, due to infection by some specific micro-organism, and the digestive tract was clearly shown to be the path of infection, as it has been so often traced to drinking contaminated water, milk, etc., and the infectivity of stools has long been recognised.

Recklinghausen, Klein, Klebs, and others have described micro-organisms in the stools, but Eberth in 1880 was the first who isolated the bacillus which has been later identified with typhoid fever, and Gaffky, in 1884, furnished us with a fuller and more detailed account. Since then observers have more clearly recognised the intimate relations

* This communication contains the substance of a thesis for which the M.D. Cantab. was granted, 1897.

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between this bacillus and the disease. Gradually the distinction between the specific bacillus and those ordinarily found in the intestine has been determined; but great reluctance has been shown by many in acknowledging it as the *vera causa* of enteric fever, and it is by no means indisputably proved that it is so.

The bacillus has not been found in the blood under ordinary circumstances, and enteric fever would be considered as a disease in which the condition of the blood was profoundly modified.

The etiology of enteric fever would point to a spore condition of bacillus from its prolonged vitality out of body in water, whereas, according to Klein, the bacillus cannot be found after two or three weeks.

Liebermeister considers it essential that a spore state should exist for the maintenance of the view that it is a true cause of enteric fever. Eberth and Gaffky first thought there was a spore stage, but Buchner and many others have shown conclusively that it does not form spores.

None can be detected by any staining re-agents, and dried juices of typhoid spleen or dried cultures of the bacillus do not reproduce bacilli, and though in the growth on potato there is a certain look of spore formation, this is due to the irregular staining of the two ends of the bacillus.

In Klein's report to the Local Government Board for the year 1892-3, he gives a good standard account of the bacillus, which I will epitomise, though I cannot fall in with all his views.

The typhoid bacillus is found in the spleen and mesenteric glands of patients suffering from enteric fever, but only from the tenth to the twenty-fifth day. It is found in the stools of typhoid patients, but its isolation is difficult. Observers have also found it in water, but many of the instances are open to doubt. It is a long slender bacillus possessed of great motility, and if examined in a fresh state in water or bouillon the bacilli may be seen hovering about like a swarm of gnats. They seem to have a fringe all round, which probably is the fringe of cilia, and their appearance is not unlike that of a minute furry caterpillar. There are always long rods seen among the others.

The chief difficulty in regard to it is the difficulty of identification, and it most nearly resembles the bacillus coli which is constantly found in the intestine and in stools of healthy people. The differences are:—

(1) Morphology.—The bacillus coli is a short stout rod, the typhoid is longer, more cylindrical and thread like. This is well seen in the results of intra-peritoneal injections into the guinea-pig.

(2) With gentian violet the typhoid bacillus stains more deeply at the ends than in the centre, which is not noticed in the bacillus coli.

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(3) The typhoid bacillus has the greater motility, and with appropriate staining the cilia are shown to be larger and more numerous, interlacing with those of its neighbour, and giving to the organism the appearance of a spider.

Cultural Differences.—In agar stab and stroke cultures the appearances are similar, but the growth of the bacillus coli is more rapid.

Growth on Potato.—The bacillus coli usually forms a creamy growth, thick and raised, turning to yellow, while the bacillus of typhoid forms a transparent, hardly visible growth.

Milk Test.—In skimmed milk the bacillus coli forms a clot in two days; the typhoid has no clotting power.

Indol Test.—In peptone bouillon the bacillus coli forms indol in three to seven days, while typhoid does not. (Klein tests with nitric acid.)

Gas Forming Test.—In a tube of glucose gelatine, or simply of gelatine peptone bouillon, the bacillus coli forms a quantity of air bubbles, while with typhoid none are formed.

Litmus Test.—The bacillus coli turns blue litmus agar to red in 24 hours; typhoid causes no change.

These differences are generally admitted, with some modifications and additions.

About the shape of the rods many observers maintain that there is no difference in form between the two bacilli, but my observations support Klein's statement that the bacillus of typhoid is long and narrow, the bacillus coli shorter and thicker—at least on agar cultures.

I have not noticed the deeper staining of the bacillus of typhoid with gentian violet.

The motility is not a good test, being such a relative matter and not capable of a proper comparison.

I think there is little difference, but have noticed that the longer rods which are found in masses of both bacilli are very much more motile than those of normal size. The latter seem simply to hover and move about in their immediate neighbourhood, whilst the long ones dart right across the field.

As to the cultural differences, we may accept Klein's statement with one or two modifications. On almost all media the bacillus coli has a heavier and more rapid growth, and this is seen in surface and stab inoculations and with the separate colonies on plate cultures.

This last is the method generaly used for separation of the two bacilli. The colonies of the bacillus coli appear early, are round or oval, and homogeneous when imbedded in the gelatine, but spread out irregularly on the surface.

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The typhoid colonies, on the other hand, even the deep ones, are less regular in outline, pale in colour, and are broken up into collections of droplets of an oily appearance, and on the surface are very transparent and irregular, whilst their very slow growth is distinctive.

The potato test is usually good, but the potato must be acid, or else the heavy creamy growth of the bacillus coli is not seen.

The typhoid bacillus on potato is very large and stout, and is usually a larger bacillus than the bacillus coli.

The milk, litmus, and gas formation tests are admitted as distinctive.

The indol test is distinctive, but we cannot accept Klein's nitric acid test as satisfactory, on account of the xanthoproteid reaction being similar. Kitasato's test of sodium nitrite (·02 per cent) with two drops of strong sulphuric acid is more reliable.

It is noticeable that the typhoid tests are all negative with the exception of Widal reaction, which will be described afterwards.

In Klein's autopsies on cases of typhoid, the bacillus was found in nearly every case in the spleen and mesenteric glands; but it was never found in the blood, which in several instances contained streptococci, having a very virulent toxic action on guinea-pigs.

Pure cultures of the typhoid bacillus injected into the peritoneum of the guinea-pig cause peritonitis and death; some observers have noticed hyperæmia and swelling of Peyer's patches, but the result is much the same as if the bacillus coli were injected. There are no special lesions, but a general septicæmia.

Roux and Roudet have argued from this that the typhoid bacillus is a modified form of the bacillus coli, and that its presence in the spleen is due to the disorganised condition of the mucous membrane at the Peyer's patches.

Klein, taking the contrary opinion, states that they are found in the spleen before any ulceration of Peyer's patches occurs, and that they are not found in later stages.

As regards the theory of the origin of the disease from eating oysters, we have valuable evidence on the subject from Cartwright Wood, who in his paper on "Transmission of Disease by Oysters" (*British Medical Journal*, September, 1896), has shown by experiments that the typhoid bacillus can exist in sea water from two to three months, also that if oysters be placed in water contaminated with typhoid bacilli, the bacillus can be recovered from the oyster fluid up to the eighteenth day, although they have been bathed daily in fresh sea water.

Although his experiments in a small tank with virulent pure cultures of bacilli is vastly different as to conditions from the natural life of the oyster, we may take it as evidence of the possibility of the infection of oysters when placed within reach of sewage contamination.

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Many authors have maintained that the bacillus of typhoid could be isolated easily from the stools and urine of typhoid patients; and it was with the object of proving this and of finding out the best possible methods of isolating the bacillus, that I have made a series of experiments with urine and fæces of typhoid patients.

The early and accurate diagnosis is an important matter in regard to treatment and the prevention of the extension of the disease; and the bacteriological verification would be of the greatest assistance to the practitioner and health officer, as in typhoid fever there are many cases where it is impossible to give a diagnosis absolutely without doubt.

I have examined in all 16 specimens of urine and 20 of fæces, all from separate cases presenting typical symptoms of enteric fever.

It will be better that I should give the methods I have adopted in my researches, and then tabulate the different cases with special points of importance about each.

In examinations of the fæces, inoculations of two or three loopfuls were made from the liquid stools into peptone bouillon, and this served as a stock tube.

From this inoculations were made into tubes of phenylated bouillon (Parietti's solution) of various strengths. From these cultivations were made into ordinary shake gelatine plates, while stroke cultures were made on potato gelatine.

Parietti's solution is made as follows :—

Acid carbol., 5grms.; acid hydrochlor., 4cc.; water to 100cc.

It was necessary to find out the right amount to be added to the bouillon, so that the bacillus of typhoid should just be able to develop; and it was found that the typhoid bacillus would just grow if 0·15cc. were added to 5cc. of the bouillon, while the bacillus coli would grow if 0·25cc. were added to the same amount—that is, the bacillus coli would grow in a 0·25 per cent solution of carbolised bouillon, and the typhoid in a 0·15 per cent solution.

It is noteworthy that if the same amount be added to a gelatine tube or plate, no growth occurs.

I used this for some time in my experiments, but found that other organisms grew, and that many cocci and large proteus bacilli will grow in the same strength of Parietti's solution as the bacillus of typhoid; so I soon gave up using this method.

The potato gelatine is a medium which was prepared by Holz and modified by Elsner.

Take one-half kilogram of potatoes, scrape, and wash well, grate into a pulp; collect this in a clean cloth, and press through the cloth into a sterile flask. Allow it to stand 24 hours, filter, and add 10 per

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cent gelatine; neutralise; add 1 per cent potassium iodide, and sterilise. The potassium iodide should be added only to the quantity of gelatine in immediate use.

This medium was said to distinguish the growths of the bacillus coli and the bacillus typhosus. In a stroke culture there is a decided difference. The bacillus coli grows much faster; the growth is opaque and thick, with coarser granulations. It is all in one mass, with irregular edges, though in the middle of the stroke there are separate rounded colonies.

Typhoid grows more slowly; it forms a transparent, thin, opalescent growth, appearing under a low power as a collection of pale spherical colonies, like separate droplets of oil.

With the shake culture poured out into a Petri's plate, there is a very little difference between the bacillus coli and the typhoid, so that it is necessary that a small part of a bouillon culture should be stroked on to the surface of a gelatine plate. Although it is possible in a mixture of pure cultures to pick out a small piece of typhoid growth, I found it of little use in my experiments with fæces and urine.

In my following experiments I adopted the method of direct inoculation from the stock bouillon tube into tubes of gelatine peptone bouillon, which were then poured out into Petri plates, making two or three dilutions, taking two loopfuls from tube A, and inoculating tube B, and four or six loopfuls from tube B into tube C, I nearly always found that the second tube gave a good plate, containing twenty to thirty colonies, which could be left for some time without any liquefying colonies spoiling the plate. The fewer the colonies, the larger and more rapid the growth was my experience. This is the method usually adopted in Professor Delépine's laboratory.

At one time in my work I was dissatisfied with the ordinary gelatine, and I made a trial of some of my own preparation, from a fresh bullock's spleen, thinking that there might be some substance in the spleen pulp favourable to the growth of the typhoid bacillus.

This theory was scarcely borne out by the experiments, but it was a much more favourable medium for the growth of both the bacillus coli and typhoid than the ordinary gelatine peptone bouillon.

Later I tried the addition of various salts to the gelatine, and found that the addition of 5 per cent of neutral sodium citrate had a favourable effect on the growth of the typhoid bacillus.

The plates are usually ready for observation on the second day, but I usually waited till the third, as I have always found the typhoid later in growing than the bacillus coli.

The difficulty caused by liquefying colonies seems to me to be much exaggerated. It can be obviated by diluting the tubes, and though

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liquefaction may occur in the hot weather, all my plates were singularly free from it during my work from November to April.

According to the text books the distinction between the colonies of bacillus coli and bacillus typhosus is this—The bacillus coli forms a spherical, oval, or almond shaped colony, with a perfectly even edge; the typhoid bacillus, on the other hand, forms an irregular spherical colony with wavy outline.

I have found this to be true only to a certain degree. In a plate of bacillus coli there will be more round colonies with smooth outline than in one of typhoid; but it is by no means distinctive, and this only applies to the small ones imbedded in the gelatine. When the bacillus coli reaches the surface, it spreads out in a very irregular way.

What, then, is the distinction?

After the examination of a great number of plates, I can only say that the typhoid colonies grow more slowly and to a less extent, are much more transparent, and have a finer granulation.

I take the following typical example from my notes: I made a mixture of the pure cultures of the two bacilli, and after double dilution obtained a good plate, containing on the second day thirty large colonies of undoubted bacillus coli, some very minute ones which were doubtful, but none with the appearance of typhoid.

On the third day one of the small ones was recognised as typhoid, and on the fourth another, so that out of thirty to forty colonies only two turned out to be typhoid.

It would seem from this that in mixtures the typhoid bacillus is apt to be beaten by its more vigorous neighbours in the struggle for existence.

In some of the experiments I used large slices of potato, placed in a Petri's capsule and sterilised, and I inoculated this with any likely colonies found on my gelatine plates. Theoretically, this should have helped me considerably by absolutely differentiating the two bacilli, and as I could put ten or twelve colonies on the plate, I ought to have found one typhoid colony, at least.

However, I found this of very little practical value, as the bacillus coli sometimes forms quite a small transparent growth on potato.

In staining the bacilli for cilia I have found Van Emergen's method much the best, and a fresh agar culture gives the best result.

Great care is needful in the preparation of the film, as the bacilli must not be closely packed, and they will lose their cilia unless they are carefully handled.

I find the best method is to remove a small quantity with a platinum needle and deposit it in a small quantity of water, stirring gently; then leave it for half an hour, and the bacilli will spread equally through the water, and two or three loopfuls of this will make a good film.

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I give the following brief notes of the examination of the stools of twenty cases of undoubted enteric fever:—

(1) J. R., æt. 9, ninth day of disease. *Method:* Carbolised bouillon, with several G.P.B. plates and Elsner's gelatine stroked plates. *Result:* I found a large number of colonies of bacillus coli, but none giving the typhoid reactions, and also a colony of a large fluorescent bacillus liquefying gelatine, and turning all the media into a bright green colour.

(2) C. M., æt. 35, eleventh day of disease. *Method:* Carbolised bouillon and G.P.B. plates. *Result:* Many colonies of bacillus coli; no sign of typhoid.

(3) G. S., æt. 16, early in third week. *Method:* Carbolised bouillon and G.P.B. plates. *Result:* Many colonies of bacillus coli were found; others resembling typhoid, but did not conform to typhoid reactions.

(5) J. B., æt. 11, early in third week. *Method:* Carbolised bouillon and gelatine plates. *Result:* Colonies of bacillus coli, liquefying diplococci, and the bacillus fluorescens were found; no typhoid.

(6) Æt. 21, end of third week. *Method:* Direct inoculation with G.P.B. plates, with three dilutions; other plates made from weak carbolised bouillon. *Result:* Several colonies found resembling typhoid in appearance of colonies and shape of bacillus. They do not clot milk; they have transparent growth on potato; but, on the other hand, they form air bubbles in a shake tube of G.P.B., and have a faint acid action on litmus.

(7) J. B., end of second week. *Method:* Direct inoculations of G.P.B. with four dilutions, and later other plates from carbolised bouillon. *Result:* The examination of the plates was much hindered by the presence of an enormous number of diplococci colonies which liquefied the gelatine very quickly. I attempted to exclude the liquefying organism by growth in carbolised broth, but, though I used the usual strength, no growth occurred, and, the stock tube being lost, there was no result. This is the only occasion that I have met with this energetic liquefying organism—a large diplococcus.

(8) J. D., æt. 23, third week. *Method:* Direct inoculation of G.P.B.; three dilutions. *Result:* I again found the bacillus resembling typhoid in being long and narrow, and giving the typhoid characters in milk and potato cultures, but forming air bubbles with gelatine shake cultures, and having acid reaction with litmus agar. On potato the bacillus assumes a larger form than the bacillus coli or typhoid.

(9) W. S., æt. 18, early in third week. *Method:* Direct inoculation of G.P.B. plates, the second plate being best. *Result:* Bacillus coli and sarcinæ were found, and the pseudo typhoid or intermediate bacillus, giving typhoid reactions with milk and potato, but forming gas in G.P.B. shake culture, and having faint acid reaction. It has a slow but complete reaction with anti-typhoid serum. (One drop of the non-diluted serum to ten drops of the culture.)

(10) B. S., end of third week. *Method:* Culture in a weak solution of carbolised bouillon and inoculation on G.P.B. plates, with three dilutions; as usual, the second one was best. *Result:* Two colonies were found having the typical appearance of typhoid colonies, but giving all the reactions of the bacillus coli. This strongly confirms my experience of the impossibility of judging from the mere appearance of the colony.

(11) M. J., æt. 21, end of second week. *Method:* Direct inoculation of spleen; gelatine tubes, with three dilutions. From the plates the most likely colonies were inoculated on to a large slice of sterilised potato in a Petri's capsule. *Result:* A bacillus was found having the appearance and giving all the reactions of the typhoid bacillus.

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(12) N. T., end of second week of relapse. *Method:* Direct inoculation on spleen gelatine plates. *Result:* A colony was found of a bacillus-like typhoid giving typhoid reactions with milk and potato, but not with G.P.B. shake and litmus agar cultures. Cilia were not well shown.

(13) Middle of third week. *Method:* The bouillon inoculated was left twenty-four hours at ordinary temperature, and direct inoculations were made into G.P.B. *Result:* Bacillus coli only were found, some of which have transparent growth on potato.

(14) A. H., æt. 6, early second week. *Method*: Bouillon stock tube stood for 24 hours, and direct inoculations were made into spleen gelatine plates with three dilutions. *Result*: A colony of the "intermediate" bacillus was found, giving typhoid reactions with milk potato and anti-typhoid serum, but having gas forming and acid reactions. No indol reaction was obtained. Another series of inoculations was made after standing for ten days with precisely the same result.

(15) H. L., æt. 7, eighteenth day. *Method*: The bouillon tube was allowed to stand for 24 hours, and direct inoculations made on to spleen gelatine plates. *Result*: Two colonies were found on the fourth day of a bacillus, giving all the typical reaction of typhoid.

(16) E. H., twelfth day. *Method*: Similar to above. *Result*: The same intermediate bacillus found. Another series of experiments was made later on, and a colony was found resembling typhoid and having all the typhoid reactions, with the exception of an acid reaction or litmus agar. The cilia were very well marked.

(18) M. M., twenty-fourth day. *Method*: Same as before. *Result*: The "intermediate" bacillus found. A week later another set of inoculations brought to light a curious colony with a scaly or horny appearance. The bacillus is long and narrow, very motile, bearing good cilia. It has most of the reaction of the bacillus coli, but does not form air bubbles, though it liquefies gelatine very slowly. It is remarkable for a very strong indol reaction, infinitely stronger than that of bacillus coli.

(19) J. G., eighteenth day. *Method:* Same as above. *Result:* I found principally colonies of bacillus coli which were remarkably transparent. Another series of inoculations made two weeks later with the same result.

(20) C. R., æt. 11, seventh day. *Method*: Similar to above. *Result*: Two colonies found like typhoid, giving reactions of the intermediate bacillus. On the fourth day a colony like typhoid was found giving all the reactions of typhoid. It consists, however, of such very small square bacilli that I have difficulty in believing it to be typhoid. The motility is not nearly so great as typhoid.

In these twenty cases I found the typical typhoid bacilli in only two cases. In eight others I found a bacillus giving some reactions of typhoid, and others of the bacillus coli, and which I have called the "intermediate" bacilli, and since I began the direct inoculation method I have found it in all but two.

It is noteworthy that the colony and the bacillus are indistinguishable in appearance from the typical typhoid.

The bacillus found in No. 17 is of interest in having an acid reaction, but no gas forming action.

Also the scaly colony in No. 18, with such strong indol forming capacity, must be reckoned as a coliform bacillus; but it is very different from the ordinary bacillus coli, which is evidently not the chief producer of indol.

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The outside temperature has a great effect on the liquefying organisms, which are much more frequent in summer than winter; in some cases my whole series of plates were quite free from them even when using no phenylated bouillon.

In examination of the urine of patients with enteric fever it was my custom to get them to pass their urine direct into sterilised bottles with wide necks.

In the laboratory I first of all took out 1cc. with sterilised pipette, and inoculated peptone bouillon and carbolised bouillon tubes, but as in some cases I got no growth at all, I next allowed the bottles to stand for 24 hours, and syphoned off the upper three-fourths of the fluid with better results.

I also tried filtration, and made inoculations from washings of the filter, but I found that the simplest method was to syphon off the fluid through a sterilised plug of cotton wool.

A syphon with a diameter of about half-an-inch was made, and the neck constricted. A plug of cotton wool is placed lightly in, and the whole sterilised together. By this means if there are any typhoid organisms in the urine they are sure to be caught in the plug, and this can be moved into a bouillon tube stirred about with the platinum spatula, and from this tube inoculations can be made into any media.

As there was little success in the experiments I will merely tabulate them with the results.

(1) 9th day, a coliform bacillus.
(2) 11th day, no growth.
(3) 11th day, coliform bacillus, cocci, and typhoid (?)
(4) 16th day, diplococcus with fœtid odour.
(5) 22nd day, diplococcus with fœtid odour.
(6) 24th day, no growth.
(7) 14th day, cocci.
(8) 20th day, cocci and large protei.
(9) 21st day, coliform bacillus.
(10) 25th day, coliform bacillus and diplococci.
(11) 20th day, coliform bacillus.
(12) 14th day, coliform bacillus and a long transparent bacillus.
(13) 12th day, coliform bacillus and same long bacillus.
(14) 5th week, diplococci and coliform bacilli.
(15) 25th day, coliform bacillus and diplococcus.
(16) 25th day, liquefying diplococcus.

It will be seen from these that I found only one colony of doubtful typhoid bacillus. It was doubtful in that I was not able to follow it up up and apply the confirmatory tests. I had made direct stroke inoculations from urine on to a potato gelatine plate (Elsner), and both

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from the appearance of the colony and morphology of the bacillus I judged it to be typhoid; but it was so minute and so closely surrounded by others that it never appeared again in later cultures.

It will be noticed that I found a coliform bacillus in eight cases out of sixteen; the bacillus was somewhat larger than the one usually found in the stools, but after some growths on agar they were indistinguishable, and their reactions were similar. As to the relation of albuminuria to the presence of the coliform bacillus, the evidence is that it is not necessary. I tested the urines from 10 to 16, and found No. 14 to be the only one containing albumen.

In Nos. 12 and 13 there was found a curious and interesting organism —the long inert transparent bacillus.

About the fifth day three or four colonies developed on each plate; they were of a very transparent growth, and resembled colonies of typhoid. The bacilli are long and slender, and take only a slight stain; they have very little motility, and have no cilia. They have all the negative reactions of typhoid, but differ from it in being larger and non-motile. Their growth on agar is so transparent as to be almost invisible.

The absence of the typhoid bacillus is against the experience of many observers, unless they have failed to differentiate it from the coliform bacillus.

Dr. P. Horton-Smith read a paper at the Royal Medical and Chirurgical Society on the matter, February 9th, 1897. He said that he had examined 61 specimens of urine from seven cases of enteric fever. Small and large quantities of urine obtained aseptically were inoculated on to gelatine potato, and all suspicious colonies examined. The special tests were—(1) Cilia; (2) serum test; (3) power of forming acidity in milk in 24 hours.

In three of these cases he found the bacillus at one time or other, but never in the other four. He never found it before the third week of the disease, and in one case it had persisted in the urine for 22 days after the temperature had come down to the normal. His conclusion is that examination of the urine is of little use for the diagnosis of the disease, as its presence is not constant, and does not occur until the third week.

I cannot admit his test No. 2 as being at all distinctive of the typhoid bacillus, as I have obtained it with other coliform bacilli. Professor Delépine has pointed out on various occasions that, though it is possible with a known pure culture of typhoid bacillus to test whether a serum is that of a typhoid patient, the reverse is not the case.

It is necessary in this paper to give some account of the typhoid serum reaction which has been so much discussed lately, but as my own work has occupied so much of my space, I will only briefly touch on it.

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The reaction depends on the antagonistic action of the serum of an animal immunised against a disease on the specific micro-organism of that disease. Pfeiffer was the first to work out this, then Metchnikoff and Bordet, Gruber, Durham, Widal, Grünbaum, and Delépine, have all published articles on the matter. Working under Professor Delépine, I have had opportunities of seeing the work done by him and Dr. Sidebotham, and their work is now largely used by health officers round Manchester.

Delépine's method is this: Neutral bouillon cultures of typhoid are made from agar cultures. Ten or twenty loopfuls of this are put on to a cover glass, and one loopful of the serum from a typhoid case is mixed with them; in five to fifteen minutes the bacilli lose their motility more or less and agglomerate in masses. The serum is collected as follows: A pipette is made with one end A constricted, and a constriction in the middle B, the other end C being filled with cotton wool. A is sealed and the tube is sterilised.

The finger of the patient is washed with soap and antiseptic lotion, a handkerchief or tape is wound round it from the base to collect blood about the end of the finger, a prick is made with a sterilised knife or needle about ¼in. above the nail, and the sealed end A is broken and some blood aspirated or allowed to run into the tube which is now sealed at A and B, and the part BC broken off. It can now be sent to the laboratory and centrifugalised to separate the serum, or the blood may be used as it is.

The use of the hanging drop method is objected to by Professor Delépine on account of the possibility of clumps being formed by gravitation. A thin film between cover glass and slide is much preferable for observations, and it can be kept from drying for some days by keeping it in a moist chamber. To avoid error, it is well to have a control preparation of the typhoid bouillon without any addition of the serum.

Under these conditions agglomeration, if it is likely to appear, will usually occur in five minutes, and if it does not in the first hour it is rarely that it will occur completely at all. It usually does not commence till after the third day of the fever, and is occasionally later.

Gruber and Durham's method is somewhat different. They take a loopful of agar culture of the typhoid bacillus and mix with 0·5 cc. of bouillon, then they take 5 mgs. of serum and mix well with 0·5 cc. of bouillon. The two fluids are mixed in a narrow sedimentation tube and allowed to stand for 30 to 60 minutes, then if the serum be that of a typhoid case, a sediment will be found at the bottom of the tube and the fluid will be clear.

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Wyatt Johnson reports excellent results with the dry blood process, but says the bacillus must be attenuated.

My experience is that the reaction is by no means diagnostic of the typhoid bacillus. Nearly all the "intermediate" bacilli gave good reactions at once, and the scaly colony in case 18, which liquefies gelatine slowly, gave a perfect reaction at once, but I have not in all cases previously diluted the typhoid serum.

I have obtained an imperfect reaction with the ordinary bacillus coli when grown on agar, but never in a bouillon culture.

It is very necessary to examine all the cover slip, as the fluids may not be properly mixed.

I have made several experiments with typhoid urine, but have not got any reaction at all, nor have I obtained any from the filtrate of a four days' bouillon culture from typhoid stools. This agrees with Widal and Delépine's results.

To sum up the results of my work, I must regard them as being more negative than as teaching many new points about the bacillus. It seems to me evident, however, that it is useless to attempt the diagnosis of typhoid by searching for the bacillus in the stools or urine. No doubt at first my experiences would lack weight, but later I think my plates were as good as could be wished for, and I spent a great amount of time over them, and examined all the colonies which were not clearly those of the bacillus coli.

The finding of an "intermediate" bacillus is interesting in regard to the relation between the bacillus coli and typhoid. Many observers have thought that one was merely a modification of the other. The presence of organisms having reaction intermediate between the two would go far to support this theory, and especially the complete reaction with anti-typhoid serum.

Until we find out better methods of differentiating the typhoid bacillus from the other coliform bacilli, all our efforts to isolate it from the stools will be attended with the maximum of time and trouble.

If we find a likely colony it is usually the third day before it is large enough to transfer to other media, and one or two more days must be taken up with the various confirmatory tests, and thus at the earliest five or six days must elapse before a suspected case of enteric fever could be confirmed by bacteriological examination of the excreta.

[Note.—Since this was written much work has been done on the subject, and numerous papers written introducing new methods and tests; but I have found it impossible to embody a summary of those in this paper, and there is still considerable difference of opinion as to the classification and relations of the colon bacilli.—J. R. C.]

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CHRONICLE.

Medicine.

UNDER THE CHARGE OF JULIUS DRESCHFELD, M.D., F.R.C.P.

The Practitioner, June, 1898.—SPECIAL TUBERCULOSIS NUMBER.

THIS special number of the *Practitioner* is one which will well repay the careful study of every medical man. It opens by pointing out that no pestilence affecting man works anything like the havoc that tuberculosis does, and it proclaims a crusade against this fearful scourge, the probable utility of which it proves by quoting Ransome to the effect that the death rate from tuberculosis has decreased by nearly two-thirds in the last fifty-eight years, a period which has witnessed most of the sanitary reforms which have taken place in this country.

Sir Samuel Wilks leads off with an article which gives a keynote to the whole work, and which may be summarised in his final words: "Air, air; fresh air."

Dr. Ransome contributes an article on "Susceptibility to Tuberculosis under Different Conditions." He shows that no *race* of man is exempt, but that some (negroes and the native races of recently-colonised countries) are especially susceptible; that no *climate* and no *locality* are immune, but that warm, moist climates especially predispose; and that, as regards locality, the relative frequency of tuberculosis depends chiefly on density of population, some areas being specially infected. Damp, clayey *subsoil* is one of the most important predisposing factors—partly, perhaps, by predisposing to catarrhal affections, and partly because the ground air from such soil forms an excellent soil for the growth of tubercle bacilli. Good drainage causes a decrease of 50 per cent. *Sex:* In the first year tuberculosis affects boys nearly twice as often as girls; in the second year it occurs 3½ per cent oftener in boys; from three to five years, slightly more girls are affected. Altogether, there is a slight excess of females for all ages, but in various localities the relative proportion is dependent on social conditions. *Age:* Chief mortality, 25—35 years. *Heredity:* (1) Direct infection before birth is very rare; (2) hereditary transmission of germs which remain latent for a time is most improbable; (3) hereditary transmission of a tendency to contract phthisis is quite possible, but other causes (infected dwellings and workshops, etc.) are much more important. Heredity, therefore, is a comparatively small factor.

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Dr. Sims Woodhead writes on "Bacteriology":—The tubercle bacillus was discovered by Koch only in 1883, and its peculiar characteristics as regards staining are probably due to a layer of fatty acid round each bacillus. Besides the ordinary forms others are occasionally found (threads, branching and budding bacilli, vacuolation, stained protoplasmic nodes, etc.), and these occur especially in the luxuriant growths which form when the bacillus has been grown for some time on a suitable medium. Coppen Jones believes that the tubercle bacillus is only an accidental phase in the life-history of a higher fungus (possibly allied to actinomyces), which probably leads an almost entirely saprophytic life.

In the human being the bacilli, except in giant cells, are extracellular; but occasionally, especially when recovery is taking place, they are found inside epitheloid cells. In animals, especially the more resistant ones, they are frequently intra-cellular.

A description is given of the various forms of tuberculin prepared by Koch, and the following is a short abstract of the methods used:—(1) Original tuberculin. A pure cultivation of tubercle bacilli is grown in glycerine broth for some time; glycerine is added up to 40—50 per cent, which dissolves out certain immunising products. The marked local and constitutional symptoms caused by the injection of this are due probably to the toxic material thus injected being added to that already existing in the body in the neighbourhood of the bacilli. (2) "Tuberculin Alkalisches." A pure cultivation of tubercle bacilli was pounded in decinormal caustic soda. A solution of proteid substances with a few bacilli in it was thus formed, and its injection was found to give greater immunity than the old tuberculin did, but local inflammatory changes were also caused. On filtering out the bacilli the immunising power was greatly lost, and so it seemed to lie in the bacilli themselves from which it is not readily removed, owing to the protecting layer of fatty acid which lies on their surface. (3) R. Tuberculin. Dry culture is pounded in an agate mortar, distilled water added, and the whole centrifugalised; a colloidal mass (Tuberculin Rest; T. R.) is left, containing some undestroyed bacilli. This is dried, pounded, extracted with water and centrifugalised, and the whole process repeated again and again till no bacilli are left; 20 per cent glycerine is added, and a mixture is made of such a strength that 1 cc. = 10 mgrm. of the dried substance. Koch claims that by the use of this immunity can be obtained without local or constitutional disturbances. He distinctly says that it is unsuitable for patients who have only a short time to live, as no curative effect is obtained until about 1mgrm. has been injected, and that it is unsuitable for cases of mixed infection, which should always be suspected when the temperature rises above 100·4° F.

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In the chapter by Dr. Allan Macfadyen on the "Relation of Tuberculosis of Animals to Man," it is pointed out that the chief modes of infection from animals are by meat and by milk. The animals oftenest affected are cattle, swine, and poultry, then come carnivora and horses, while goats and sheep are rarely affected. In cattle the lungs and other organs and the serous surfaces are oftenest affected. Tubercle bacilli are very rarely met in muscle or its juice, but there is a probability of their infection from the affected organs in the process of flaying and dressing, and a perfectly healthy carcase may be infected by the slaughterer in the same way. With proper care in flaying, etc., much meat may be consumed without danger from an animal only locally affected. Milk may be adequately sterilised by heating to 176°—198°F. in a water bath; the Royal Commission, however, prefers boiling as being the simpler process. The Commission arrived at the conclusion that there is no danger of the milk being infected unless there is udder disease, but many authorities think differently.

Dr. Macfadyen advises an adequate inspection of cattle by veterinary surgeons and the removal of suspected cattle from dairy sheds; the systematic use of tuberculin as a diagnostic agent; adequate control of the milk on the way to the consumer, and a more general use of the Pasteurising process on a large scale by dairy farmers.

"Sanatorium Open-air Treatment in Pulmonary Tuberculosis." Dr. Hermann Weber here discusses the essentials of a well-appointed sanatorium, both as to site, construction, and the methods pursued. A feature of such establishments is that in addition to the benefits received at the time, the patient is educated as to how to manage himself, his sputa, etc., afterwards. As regards exercise, Dr. Weber thinks that even when there is pyrexia carefully graduated exercise during the apyrexial portion of the day is probably better than absolute rest. The collected statistics of patients at several sanatoria some years ago gave the following results: Recovery, 13—14 per cent; nearly perfect recovery, 15—17 per cent; great improvement, 26—28 per cent; stationary, 22 per cent, and worse, 22—23 per cent. Dr. F. Rufenacht Walters also contributes a very instructive article on "Sanatoria for Consumptive Patients," which is too full of information to be profitably further condensed. He points out forcibly how England has lagged behind other countries in providing such places for rich and poor alike.

Dr. Theodore Williams, in his article on the "Treatment of Pulmonary Tuberculosis by Residence at High Altitudes," expresses the belief that, on the whole, patients do better in sanatoria at high levels than in the low-level ones. In 350 cases so treated the results were as follows:—General effects: Improvement, 83 per cent (cure, 41 per cent; great improvement, 70 per cent). Local effects: Improvement,

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75½ per cent (arrest, 43 per cent; partial arrest, 27 per cent; decrease of disease, 5½ per cent). As regards the selection of patients, hæmoptysis due to a limited lesion is no bar, but when due to acute excavation of the lung, it is likely to be increased. Cases with marked pyrexia of the double cavity, or of any form of advanced or acute phthisis, those whose lung surface is much decreased and who show signs of dyspnœa and lividity, and cases of catarrhal or laryngeal phthisis, should not be sent to high altitudes.

Dealing with the "Open Air Treatment of Phthisis in Great Britain," Dr. Burton-Fanning gives his experience during three years at Cromer. Of 24 patients 2 were cured, 4 relatively cured, 12 improved, and 6 only temporarily improved. During the winter they spent on an average 6½ hours a day in their shelter.

Dr. Hector Mackenzie treats of the "Medicinal Treatment of Tuberculosis," which, he thinks, is in danger of being underrated in these days of fresh air treatment, and whose efficacy has been extensively proved in the treatment of out-patients. He does not advise the use either of R. tuberculin or any of the antituberculous sera. He pins his faith chiefly to cod-liver oil (preferably simple without any admixture), pancreatic or petroleum emulsion where this disagrees, creosote, guaiacol, and arsenic. Iron he does not find to be of as much use as arsenic for anæmia, and he thinks that when there is a tendency to hæmoptysis it increases that tendency. He regards pyrexia, also, as a contra-indication. Hypophosphites he looks on as useless.

"Causation of Tuberculosis and its Prevention by Legislation." Dr. Archibald Kerr Chalmers here deals especially with the causation of tuberculosis in connection with occupation, food, and housing. As regards food, he refers to the researches of Professor Bang, who has shown that only three to four per cent of calves have congenital tuberculosis, and that an infected herd can in a few years be replaced by a healthy one if all calves born of the tuberculous mothers are from the first day isolated and fed on boiled milk, the tuberculin test being used twice a year on them, and those found to be infected being at once removed. He concludes with the following provisions for the exclusion of tuberculosed meat and milk:—(1) The provision of public abbatoirs, and prohibiting the sale of meat (except foreign dead meat, which should be examined at the port of debarcation) from animals slaughtered elsewhere; (2) inspection of animals at the time of slaughter by a class of inspectors trained for the purpose, and acting under the guidance of specific instructions as to the conditions of disease which require partial or total condemnation of the carcase; (3) the suppression of all byres where healthy animal life is impossible; (4) the inspection of dairy cattle, and the compulsory notification by the

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owner of all forms of udder disease; (5) the suspension from sale of milk from all cattle with udder affections until the nature of the affection has been ascertained, to be followed by the slaughter of the animal if it is tuberculous; (6) the exclusion from all byres of animals obviously tuberculous.

Dr. Hermann M. Biggs, in the "Prevention and Restriction of Pulmonary Tuberculosis in the City of New York," relates a method whch has been in work for some years and has been followed by a considerable decrease in mortality. It consists in a modified system of notification, followed by and associated with a system of education and disinfection of premises, bedding, etc.

There are articles also on the Hospital Treatment of Consumption, the Mediterranean Littoral, the Desert Climate, the Climate of South Africa, and Ocean Voyages, in respect to the treatment of phthisis, which are full of information. *Robert E. Lord.*

KIDD (PERCY). "Phthisis Pulmonum." Allbutt's "System of Medicine," Vol. V.

DR. KIDD having had peculiar opportunities of observing phthisis during many years at the Brompton Consumption Hospital, it is interesting to read his article in conjunction with those just reviewed.

In connection with *the influences predisposing to phthisis* he says that the evidence negatives the idea that hot climates favour its development, but that all are agreed that when it does occur it is of a most acute and virulent type. He quotes Bowditch's views as to damp subsoil, but points out that though the subsoil of London is yearly growing drier the amount of phthisis has not shown a corresponding decrease, that in some towns free drainage has been followed by an actual increase, and that in Holland, which is decidedly damp, the phthisis death-rate is low. High altitudes, independently of sparse population, seem to have an opposing effect; even in certain very unsanitary large towns high up in the Andes the death-rate is low. Possibly this may be due to the rarity of the atmosphere compelling deep inspirations. Croupous pneumonia, as a cause of phthisis, is infinitely rare, cases recorded as such being probably either pneumonia with delayed resolution or tubercular from the onset. Traumatism is dismissed as a causative agent, though it may light up activity in latent tubercle, and Rokitansky's view that all conditions leading to a state of venosity of the blood impart immunity to phthisis is adopted as partially correct. The conveyance of tubercle bacilli in dried sputum is accepted as the prime cause of the disease, and a striking example is given of an infected house in which at least twelve persons acquired tubercular disease in the course of as many years. While the heredi-

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tary transmission of tubercle by means of bacilli or their spores through the agency of the ovum or spermatozoa is regarded as of little practical importance, the author regards it as certainly possible, and compares tuberculosis in this respect with syphilis and the "pébrine disease" of silkworms (in which this undoubtedly occurs), and he quotes a research of Mafucci, who inoculated fertilised hens' eggs with tubercle bacilli and found that the chicks, normally hatched, developed typical tuberculosis about the twentieth day. He considers that this may explain the few cases of congenital tuberculosis, but that there is no probability of such germs remaining latent for years as has been suggested. Hereditary tendency to tubercular infection he apparently regards as an open question.

Pathological Anatomy.—In adults primary basic tuberculosis occurs not oftener than once in 400—500 cases; in children it is less rare, but in them it is often due to direct extension from a tuberculous bronchial gland or spine. Acute tuberculosis of the lungs takes the form of tubercular peribronchitis or of miliary tubercles; the chronic is essentially broncho-pneumonic. The author accepts the view that the specific cells are epitheloid in origin. Associated with the primary lesions are secondary changes of a congestive, inflammatory, and œdematous type, which may not be tubercular at first but rapidly become so. The view that acute croupous pneumonia is a common termination of phthisis is scouted by Dr. Kidd, who regards the affection simulating this as being essentially broncho-pneumonic in origin and due to the inhalation of septic organisms from cavities.

The primary cavity is situated in the apex of the upper lobe, and secondary excavation occurs in the apex of the lower lobe before the lower part of the upper lobe is thus affected. The spread of infection in chronic cases takes place by means of the bronchi, and Ewart explains the proclivity of the apex of the lower lobe to infection by the fact that its bronchus is a wide straight tube coming off horizontally from the main bronchus. Dr. J. K. Fowler has pointed out that the disease follows a very definite path of extension, viz., beginning in one apex, it spreads downwards in the upper lobe; excavation is followed by secondary disease of the apex of the lower lobe of the same side and then of the opposite side (Kidd reverses the order); then the base of the upper lobe becomes affected, the disease simultaneously extending from the apex of the lower lobe forwards and downwards along the interlobular system.

According to *symptoms*, the author classifies the disease as follows:—

A.—Acute Pulmonary Tuberculosis.

(1) *Lobar-pneumonic Form* (the rarest of the three).—The greater part or whole of one lobe (nearly always the upper) is converted into

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a solid, gelatinous, or caseous material, which generally, but not always, presents scattered foci of old disease. The symptoms closely simulate those of acute croupous pneumonia and herpes may be seen. Pleurisy is almost always present. No crisis occurs, and the temperature may remain high for weeks, becoming after the first few days more remittent than in croupous pneumonia and the pulse-respiration ratio being less disturbed owing to the pulse-rate being higher. Later there may be signs of softening, and tubercle bacilli may be found in the sputum. Death generally occurs in six to eight weeks, but a few cases become chronic.

(2) *Broncho-pneumonic Form.*—This is characterised by the formation of disseminated foci of varying sizes and essentially bronchopneumonic and lobular in origin, though, by fusion, they may become lobar in size. Pleurisy in one form or another is constant, and ulceration of the larynx and larger bronchi is common. This form is due to inhalation of tubercular material from a cavity or from external sources. The onset varies, sometimes being acute, but more often insidious (with cough, succeeded in a few weeks by malaise, fever, etc.); sometimes hæmoptysis is the first symptom, and in recent years it has often followed influenza. However it starts, wasting and loss of strength, profuse night-sweats, and a hectic temperature soon follow, and death occurs in from three weeks to nine months (generally three to four months). The physical signs at first are merely those of bronchitis; later pleuritic friction and patches of dulness are found; signs of cavitation are not generally discovered as the patient dies too soon. Tubercle bacilli may be detected in the sputum.

(3) *Pulmonary Type of Acute Miliary Tuberculosis.*—This generally begins with a period of ill-health. Cough, expectoration, marked dyspnœa, and occasionally pleuritic pain, are frequent symptoms. The temperature is very high (103 deg. to 104 deg), and the morning remissions slight, but some cases show no pyrexia. Great emaciation and marked cyanosis are seen, and the disease runs a rapid course to a fatal termination. The diagnosis may be very difficult, and then an examination of the choroid and the blood for tubercles and bacilli respectively may assist.

B.—Chronic Pulmonary Tuberculosis.

This is classified according to the modes of onset, which are placed in their order of frequency.

(1) *Insidious.*—Loss of flesh and strength, accompanied by slight evening temperature, and leading up to the ordinary symptoms. Less often ushered in by anæmia or digestive troubles.

(2) *Bronchitic.*—Repeated attacks of bronchial catarrh, which are

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often preceded by a period of ill-health or by influenza; in a few weeks or months pyrexia and other symptoms appear.

(3) *Pleuritic.*—Effusion, or oftener, dry pleurisy may be followed immediately or after an interval by pyrexia and other symptoms of phthisis.

(4) *Hæmoptoic.*—When this is profuse it is almost certainly due to rupture of an aneurism into a vomica, and the disease is, therefore, of old standing though the physical signs may be *nil.*

(5) *Laryngeal.*

As regards hæmoptysis, Dr. Kidd considers that in serious cases the great majority are due to rupture of an aneurism of a branch of the pulmonary artery in a cavity. This was so in 70 out of 80 fatal cases examined by him. Death is generally due to suffocation by the blood poured out, less often to anæmia of the brain. A chronic phthisis often becomes acute after hæmoptysis, due probably to irritation of the blood in the bronchial tubes causing forced inspiratory efforts and aspiration of infective secretion in the healthy lung.

Treating of the temperature in phthisis, he refers to the fact that in some few cases the disease may be very active and yet no rise occur, and also that a subnormal temperature is often of grave import. The frequency of the pulse seems to stand in direct relation to the extent and activity of the disease and to the strength of the patient, and is of great importance in prognosis.

In the paragraphs on *Physical Examination* the difficulty of diagnosis when there is compensatory hypertrophy (emphysema) of the lung is pointed out, and also the frequency with which cavities are present but are not detected. A protest is made against regarding physical examination of the chest as the chief basis for diagnosis and prognosis in phthisis. It is further remarked that double pleurisy, whether dry or with effusion, is almost always tubercular, and that when disease is found only in the lower lobe it is not tubercular, or the older disease at the apex is masked by emphysema.

Under the head of *Complications* it may be noted that enlargement of the bronchial glands in children may cause symptoms very like phthisis, even when this is not present, by pressing on the bronchi of the upper lobe. Secondary tuberculosis of the intestines was found in 70 per cent of post mortems by Dr. Kidd. Ulceration occurs chiefly in the neighbourhood of the ileo-cæcal valve, and perforation is less rare than is commonly supposed.

The effect of parturition in hastening the cause of phthisis is said by Hanau to be due to forced inspirations during labour causing aspiration of infective material from cavities to other parts of the lung.

The average *duration* is placed at rather over four years.

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The difficult subject of *prognosis* is dealt with very thoroughly. Marked pyrexia necessitates a very guarded, but not always a bad prognosis; a normal temperature does not justify a good prognosis, and a subnormal or collapse temperature is bad. Emaciation due to profound constitutional disturbance is very bad, but when it arises only from digestive disturbances is less so. A persistently rapid or easily excited pulse is of ill omen, and anæmia and debility also are bad signs. Dyspnœa depending on diffuse and acutely extending pulmonary changes is very unfavourable. As regards expectoration, small quantity is, on the whole, a good sign; fetor like that of bronchiectasis is a bad one, as it indicates a danger of septic bronchopneumonia. The number of the tubercle bacilli has no great significance, and the significance of other micro-organisms is not yet understood. Incessant cough associated with signs of widely diffused bronchitis, especially in pyrexial cases, calls for a gloomy prognosis. Cases with severe symptoms and few physical signs should be regarded with grave suspicion. Signs of contraction of the lung are a sure index of chronicity, and cardiac hypertrophy and dilatation and emphysema point to a long course. Complications, place of abode, means, etc., are also important elements in prognosis. Heredity is ranked below all these in importance.

Treatment is discussed under the headings of preventive, specific, and symptomatic treatment. R. tuberculin is spoken of as not yet having had a sufficient trial for any definite opinion to be expressed as to its merits, but Dr. Kidd considers that the best hope for the cure of tuberculosis lies in future developments in this direction. Fresh air, nutritious diet containing a large amount of fat, cod-liver oil if it agrees, and tonics, of which strychnine and then arsenic and quinine are the best, are chiefly relied on. An alkali with a bitter infusion before meals is strongly recommended. Creosote, guaiacol, etc., are regarded as being useful only for their effect on the expectoration.

The treatment advised for severe hæmoptysis due to ruptured aneurism in a cavity is sedative, and aims also at lowering the blood-pressure. Small doses of morphia to quiet the nervous system and soothe the cough (unless there is dyspnœa due to flooding of the bronchial tubes with blood), saline purgatives, and turpentine are recommended. Astringents are condemned as useless and also harmful, in that they cause constipation; ergot is likewise condemned, both on the grounds that it has been shown experimentally to cause a rise of blood-pressure in the pulmonary as well as in the systemic circulation, and also as a result of practical experience. Chloride of calcium (gr. xv. *ter die.*) is thought to be worth trying in order to increase the coagulability of the blood. In cases of pleurisy with effusion as

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a complication of phthisis, Dr. Kidd does not advise tapping unless there is embarrassment of respiration. Empyema in cases of early phthisis should be treated on ordinary lines, but in later cases should be left alone unless it tends to point, when it may be aspirated, as free incision leaves a sinus which will probably never close, and generally hastens the end.

The treatment of other complications is fully discussed, but cannot be dealt with here. *Robert E. Lord.*

Burgess (D.). "Intra-dural tumour of the dorsal spinal cord, causing pain and loss of thermal but not tactile sensation, especially of the leg."—*Quarterly Medical Journal*, April, 1898.

The following interesting cases are recorded:—A woman, aged 53, came under the observation of Dr. Burgess, in August, 1896. She was then confined to bed, owing to loss of power in the leg. She complained of constant burning pain in the legs and lower part of the abdomen. The history was that in March, 1896, she had commenced to suffer from pain in the legs, which was worse at night, and was of a continuous burning character. The pain commenced in both legs about the same time, but was worse in the left. Pain was also experienced in the lower part of the abdomen, soon after its commencement in the legs. The pain in the *left* leg became so severe that in May she was obliged to give up her work. About the first week in June she noticed that her *right* leg was weak. The weakness in the right leg gradually increased, and about the middle of July the left leg became weak also.

On examination in August there was loss of power in both legs, but this was more marked on the right side than the left. She could not distinguish between a hot and cold test tube so readily on the right leg as on the left. Other sensory defects were so slight as to be doubtful. The plantar reflexes and knee jerks were increased, and there was both patellar and ankle clonus. She was able to pass urine, and had control over the bladder, except when the burning sensation was severe at the lower part of the abdomen. Then she appeared to have difficulty in micturating.

At a later date urine was passed involuntarily. The sensation to pain and temperature became impaired in both legs. Both hot and cold test tubes appeared hot to the patient, and sometimes the cold one appeared the warmer of the two. This impairment of thermal sensibility was most marked in the legs, but it was present also on the trunk up to the "levels of the nipples in front and the angles of the scapulæ behind." Above these levels the difference between the two tubes was appreciated quite well.

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The sensation to pain was also impaired up to the same level as the thermo anæsthesia. A slight touch with a feather was often not felt, but "repeated or coarse touch with the finger" was felt.

The last note states that the patient could still feel and localise a touch with the finger on both legs. Thermal sensibility was lost all over both legs, and greatly impaired up to the fourth intercostal space.

Post-mortem examination revealed an oval tumour ($\frac{3}{4} \times \frac{1}{2}$ inch) attached to the internal surface of the dura mater, right in front of the spinal cord, about the level of the roots of the fourth dorsal nerve. The cord was much flattened and softened by the pressure of the growth at the region mentioned. Microscopically, the growth was found to be a a spindle-celled sarcoma.

The dissociation of thermal and tactile sensibility was the most marked feature of the case, and existed for six months. The rapid onset and subsequent progress were against syringomyelia, which produces the same sensory symptoms. Beevor has reported a case in which symptoms simulating syringomyelia were produced by a tumour pressing on the cord.

ROSIN (H.). "On a peculiar albuminous body in the urine and its diagnostic importance."—Abstract *Fortschritte de Med.*, July 1st, 1898. Original paper, *Berliner klin. Woch.*, 1897, No. 48.

ROSIN reports the case of a woman aged 36 who complained of headache and pain in the back; at a later date a bilateral paralysis of the hypoglossus developed. On examination of the urine, beside casts and renal epithelium, an albuminous body was found which gave the reaction for albumose. It was precipitated by nitric acid in the cold, but the precipitate disappeared by heat. When the urine was heated up to 53° C. a thick precipitate was produced; this dissolved again when the urine was heated up to 72° C. Acetic acid and ferrocyanide of potassium produced a precipitate which disappeared by heating. The urine also gave the biuret reaction.

The patient died of asthenia following pneumonia and a gangrenous bedsore. The autopsy revealed amyloid degeneration, hypertrophy and fatty degeneration of the kidneys, and myelogenic round-celled sarcoma in many ribs.

The author believes that there was a connection between the albumosuria and the tumour of the ribs. This association has been recorded previously by Bence Jones, Sockvis, Kuhne, Kahler, Huppert, Ribbink, and others. Rosin regards albumosuria as a sign of considerable importance in the diagnosis of myelogenic sarcoma of the bones of the thorax. *R. T. Williamson.*

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Surgery.

UNDER THE CHARGE OF THOMAS JONES, M.B., B.S. F.R.C.S.

KUH. "A second contribution to the treatment of cancer by injections of alcohol."—*Philadelphia Medical Journal*, May 28, 1898, p. 995.

THE first paper on this subject was published by Dr. Kuh in the *Medical Record*, April 17, 1897. It was entitled "A Case of Primary Cancer of the Naso-pharynx, cured by Injections of Alcohol." We are told in the present communication that the patient in question has had no return of his growth. He has, however, suffered from what are described as repeated attacks of acute adenitis in the region of the angle of the jaw. These attacks are always accompanied by fever, over 101°, which subsides in two or three weeks. In November last a very small, indolent, superficial gland was noticed on the right side of the patient's neck, midway between the mastoid bone and the acromial end of the clavicle. It remained stationary for several weeks, and when examined in February of this year it was found to have grown to about two or three times its original size. We are told this is to be submitted to the alcohol injection treatment. While we are ready to admit that the patient derived benefit from the course of treatment to which he was subjected, it is incorrect to employ the word "cure" in connection with his case.

Some more examples are given in the present contribution; but, after careful perusal of them, we fail to see how the cases have been benefited by the alcohol injections employed. Unless Dr. Kuh can furnish us with something substantial in the way of marked improvement in a case, the treatment which he advocates must be relegated to the class of unsuccessful methods.

To those who may wish to study the matter *de novo*, the following references, appended to Dr. Kuh's paper, will be found of service:—

O. Hasse. "Ueber ein neues Injectionsverfahren zur Behandlung von Carcinomen."—*46. Versammlung Deutscher Naturforscher und Aerzte*, 1873.

O. Hasse. "Ueber einige Ursachen der häufigen Wiederkehr der bösartigen Geschwülste."—*Correspondens-Blätter des allgemeinen ärztlichen Vereins von Thüringen*, 1895.

O. Hasse. "Zur Krebsheilung."—*Virchow's Archiv*, 146 Bd., 1896.

O. Hasse. "Die Injectionsbehandlung chirurgischer Krankheiten."—*Therapeut. Wochenschr.*, Wien, No. 41, 1896.

O. Hasse. "Zur Krebsheilung," II.—*Virchow's Archiv*, 149 Bd., 1897.

C. E. de Sajous. *Monthly Cyclopedia of Practical Medicine*, January, 1898.

Thomas Jones.

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KEEN (W. W.). "The Cartwright Lectures on the surgery of the stomach."—*New York Medical Journal* and *Philadelphia Medical Journal*, May 7 and 21, and June 4 and 11, 1898.

UNTIL 1875 the surgery of the stomach did not exist, except in a few isolated cases. Since that time such rapid strides have been made that two Continental surgeons have been able to collect no less than 550 examples of a single operation upon the organ (gastro-enterostomy). Apart from anæsthesia, the modern surgery of the stomach has been rendered possible by two means—(1) Antisepsis, and (2) experiments upon animals. The latter, in the hands of Gussenbauer and Winiwarter, showed—(1) That wounds of the stomach heal by first intention, just as do wounds of the skin; (2) that there is no digestion of the mucous membrane in the neighbourhood of the wound; (3) that the cicatrix of the operation does not interfere either with the motor or the secretory functions of the organ; and (4) that ablation of the pylorus is not followed either by too early escape of the gastric contents or by regurgitation of the intestinal contents into the stomach. Almost immediately after the publication of these experiments operations upon the stomach began to be extensively practised. In these lectures the author reviews, at great length, the various operations which are now performed.

GASTROLYSIS.—Gastrolysis, or loosening the stomach from adhesions, is an operation which has a somewhat restricted but still an important field in gastric surgery. The adhesions usually arise from ulcer; more rarely they are due to gall-stones, peritonitis, etc. They may connect the stomach to neighbouring viscera, to the abdominal wall, or occasionally to distant parts. They may give rise to colicky pains, or occasionally to fatal constriction of the bowels. In only a few cases has the exact condition been clearly diagnosed before operation. When the adhesions have been bandlike, the operations have been almost uniformly successful (12 cases out of 13). When they are broad, and especially when they arise from inflammatory thickening around ulcers, the operation presents greater difficulties, and it may even be necessary to remove a portion of the stomach-wall.

GASTROTOMY.—The indications for this operation are three in number—(1) For the removal of foreign bodies from the stomach; (2) in cases of stricture of the œsophagus; (3) for exploration of the stomach.

(1) *Gastrotomy for Removal of Foreign Bodies.*—In all 58 cases of this operation have been recorded, 47 of which were successful. The nature of the bodies removed has ranged from buttons and nails, on the one hand, to knife-blades and broken glass on the other. Amongst the means which have been employed for diagnostic purposes, the

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following may be mentioned—administration of dilute hydrochloric acid, washing out the stomach, and testing the washings with potassium ferrocyanide; the electro-magnet; the X-rays. In some cases foreign bodies have been removed from the œsophagus through the stomach.

(2) *Gastrotomy for Retrograde Dilatation of the Œsophagus.*—This operation was first performed by Loreta in 1883. In 1894 Franks collected 21 cases, 20 of which had been successful; in the remaining case the result was unknown. Dilatation can be carried out in two ways—(*a*) By immediate dilatation or incision with closure of the stomach; (*b*) in cases of extensive stricture, by the establishment of a temporary gastric fistula and gradual dilatation. Modifications of the operation have been devised by Hagenbach, Lange, and Abbe.

(3) *Gastrotomy for Exploration.*—Maylard says: "It is not too venturesome to predict that the day is not far distant when the stomach will be opened, explored, and resutured, for purely diagnostic purposes, with as much freedom and security as is now done, for instance, in the case of the brain." He quotes two cases from Bradford and Treves, in neither of which was an abnormal condition discovered, but both patients recovered and were cured of all their symptoms. The author refers to four other cases (two of which occurred in his own practice) in which the operation was carried out with success.

In all these cases of gastrotomy, whenever possible, the stomach should be washed out before operation, and, before it is opened, it should be brought out of the abdominal cavity and well walled off from that cavity by iodoform gauze.

Gastrostomy.—This operation is done for two conditions—(*a*) Non-malignant stricture of the œsophagus; (*b*) malignant disease of the œsophagus or cardiac end of the stomach. In rare cases it has been performed for malignant disease of the pharynx, ulceration, or congenital closure of the œsophagus and œsophageal pouches.

For malignant disease the operation was proposed by Egebert in 1837, but was first performed by Sédillot in 1849. At first the results were very bad: up to 1875 28 cases had been operated on, with 28 deaths. Since that time there has been a steady improvement, and the author estimates the present mortality of malignant cases at about 25 per cent, or even less, and of non-malignant cases at probably not more than 10 per cent. During recent years improvement has been effected in two directions—firstly, in performing an early operation, and, secondly, by various operative instead of mechanical devices by which subsequent leakage of the gastric contents is prevented. The author describes at some length the methods of performing gastrostomy, which have been recommended by the following writers—von Hacker,

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Girard, Ssabanejew and Franck, Hahn, Witzel, Andrews, Stamm, Senn, Kader, and Marwedel. His own experience is limited to the methods of Witzel and Ssabanejew-Franck. Both have given satisfactory results, but the latter is decidedly the better, when it can be carried out, especially in the respect that it requires no tube. He has rarely found that a tube could be dispensed with in Witzel's operation. He has never yet seen Franck's operation require a permanent tube, or give any trouble from leakage, and hence he gives it the preference over all other methods. In some cases, however, it cannot be done. If at least an inch and a half of the stomach cannot be drawn through the wound, as is occasionally the case, the method of Witzel is the one to be adopted by preference.

Ssabanejew-Franck's operation is described as follows: An oblique incision is made along the left costal margin, the abdomen is opened, the stomach is drawn out into a cone about an inch and a half long, and is secured by a ring of sutures. A second incision is then made, an inch above the border of the ribs, the bridge of skin between the two is undermined, and the apex of the cone of stomach drawn through and fixed in the second incision. The first incision is afterwards closed. The stomach is opened immediately.

In Witzel's method a long, oblique canal is formed in the stomach wall. The abdomen is opened, the stomach is drawn out and its margins surrounded with gauze, so as to make the rest of the operation extra-peritoneal. A small opening is then made near the cardiac end of the organ, and a catheter or rubber tube (about No. 25 F.) is introduced into the stomach. About 5 or 6 cm. of the protruding tube are buried in the stomach wall by means of Lembert's sutures. The stomach is afterwards fixed to the abdominal wall.

GASTRO-ENTEROSTOMY.—The indications for gastro-enterostomy are—(1) Malignant stricture of the pylorus; (2) non-malignant stricture; (3) ulcer of the stomach. The object of the operation is to empty the stomach as quickly as possible, and, in the case of ulcer, to put it at rest. Keen thinks that in the future a fourth indication may be accepted—namely, obstinate digestive troubles which have not yielded to purely medical means. In non-malignant cases the results are extremely favourable. Even in malignant disease, life may be prolonged for as much as two years, although, in the majority of cases, death is to be expected within a few weeks or months. The operation, however, gives great relief, and the question in such cases is not *how long* the patient lives, but *how* he lives.

The operation, although first performed by Wölfler so recently as 1881, has rapidly found favour. Chlumskij has published a list of 550 cases which he has collected. The mortality from the operation is now about

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33 per cent. In some of the earlier cases the first presenting coil of intestine was anastomosed with the stomach, but it was soon found that this was a most injudicious procedure, since on several occasions the seat of the anastomosis was but a little way above the ileo-cæcal valve. The first improvement in the operation was, therefore, the selection of the upper part of the jejunum as the site of union. A second error in the earlier operations was that the bowel was united to the stomach without regard to the direction of the peristalsis, and hence the gastric contents were apt to pass into and distend the proximal part of the bowel between the seat of anastomosis and the pylorus. To overcome the difficulty, Courvoisier suggested posterior gastro-enterostomy by dividing the meso-colon transversely, but this procedure sometimes led to gangrene of the colon. Von Hacker obviated the danger of gangrene by dividing the meso-colon longitudinally. The author further refers to the methods of Doyen, Kocher, and others, which have for their object the prevention of the passage of gastric contents into the proximal limb of the bowel, but states that none of them accomplish this end with safety and certainty. The ideal method has yet to be found.

Attempts have been made to diminish the risks of infection of the peritoneum by uniting the stomach and bowel before making an opening into either. The success attending these efforts has been very slight.

Between anterior and posterior gastro-enterostomy the advantages in benign cases are relatively slight. In cases of malignant disease the posterior method of von Hacker is the most desirable.

Pylorectomy.—Practically the only lesion for which pylorectomy is performed is cancer of the pylorus. The operation was first carried out by Péan in 1879. Billroth, in 1881, had the first successful case. The mortality attending the operation has been so great that, as compared with gastro-enterostomy, it has found little favour with most surgeons. In the practice of 15 well-known operators, however, the mortality in 173 cases, between 1888 and 1896, had fallen to 31·2 per cent. Amongst the chief drawbacks of the operation is the difficulty in making a sufficiently early diagnosis in cases of cancer of the pylorus. Whether a pylorectomy shall be done or not depends on three factors—(*a*) The extent of the tumour; (*b*) the extent of the adhesions; and (*c*) the extent of involvement of the glands. In all cases of extensive glandular enlargement or extensive adhesions it is wiser to select the operation of gastro-enterostomy. Pylorectomy may be performed either by Billroth's method, in which, after removal of the pylorus, the end of the duodenum is united to the cut end of the stomach, or by Kocher's method, in which the ends of the stomach and duodenum are closed, and afterwards a posterior gastro-enterostomy is done.

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PYLOROPLASTY.—This operation, which is usually known as the Heineke-Mikulicz operation, was performed first by Heineke, in 1886, and afterwards by Mikulicz, in 1887. The indication is non-malignant stricture of the pylorus, usually resulting from ulcer. A longitudinal incision is made in the axis of the pylorus, the edges are drawn apart, and are united by sutures in such a manner that the incision lies transversely to the lumen of the canal. In this way the pyloric opening is considerably enlarged. The advantages of this operation over gastro-enterostomy are the absence of any possibility of reflux of bile or pancreatic fluid into the stomach, the lower mortality, and ultimately, in many cases, the restoration of the normal pyloric action. It does not, however, give as free exit to the contents of the stomach. Haberkant, in 1896, collected 51 cases, with 11 deaths, a mortality of 21·6 per cent. On the whole the operation appears to be losing favour with most surgeons.

Analogous in its object is Loreta's operation of digital dilatation of the pylorus, or pylorodiosis, as it has been named by Greig Smith. This operation has been performed in two ways—First, after making an incision into the stomach, the pylorus is dilated, either instrumentally or preferably by the fingers; secondly, the gastric wall is invaginated by the finger and carried into the pylorus. Barton and Bull collected 28 cases, with a mortality of 31·1 per cent. In view of the large mortality and the fact that the pylorus sometimes recontracts, Loreta's operation has fallen into disfavour as compared with the less dangerous operation of pyloroplasty.

GASTRORRAPHY OR GASTROPLICATION.—Keen thinks it would be better to limit the former term to cases in which a limited portion of the stomach-wall is sutured, with or without removal of a portion of the wall, and to use the term gastroplication for those cases in which a large portion of the stomach-wall is infolded. Gastroplication has been performed in certain cases of great dilatation of the stomach as a result of atony. Fifteen cases have been reported, with only one death. With regard to functional recovery, the almost unanimous conclusion of those who have done the operation is in its favour.

GASTROPEXY.—Gastropexy, or suture of the stomach to the anterior abdominal wall, is an operation which has been undertaken for the condition of gastroptosis, or sagging of the stomach—the so-called Glénard's disease. A few successful cases have been reported.

GASTROPLASTY AND GASTRO-ANASTOMOSIS OR GASTRO-GASTROSTOMY FOR HOUR-GLASS STOMACH.—The condition of hour-glass stomach may be congenital or acquired. The latter is more frequent, and, in the great majority of cases, is due to contraction of an ulcer. The

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symptoms are those of obstruction—pain, vomiting, and distension, especially of the cardiac pouch. The diagnosis presents great difficulties: in only a few of the cases operated upon has it been made before operation. Eleven cases have been subjected to operation, but in two nothing radical was done for the relief of the condition. Of the remaining nine cases, one died from peritonitis, due to the giving way of a suture. Three methods have been adopted in dealing with this condition—(1) An adaptation of the Heineke-Mikulicz pyloroplasty, which has been termed *gastroplasty*. Four cases have been recorded, all successful. (2) *Gastro-anastomosis* or *gastro-gastrostomy*, in which an opening is made in each of the two gastric pouches and a free communication established between them by anastomosis of the two openings. This operation has been performed four times; one patient died, as mentioned above, but the other three were well after the expiration of some months. (3) Watson in one case folded the two pouches one over the other, using the narrow isthmus as a hinge: a gastro-gastrostomy was then performed. The patient made an admirable recovery.

Tumours of the Stomach.—Amongst these are included localised cancers, sarcomata, and myomata, which admit of removal by gastrotomy or partial gastrectomy, as distinguished from pylorectomy or total gastrectomy for cancer. Details are given of seven operations of this nature, which have been collected from various sources. Six of the patients recovered; one died on the fifteenth day, from embolic pneumonia.

Hernia of the Stomach.—The stomach has in one case been found in a femoral hernia, and in six cases in inguinal hernia. Only once was the exact diagnosis made before operation: in this case the portion of the stomach in the hernia became distended every time the patient ate or drank.

Gastrectomy.—(1) *Partial Gastrectomy:* With the exception of removal of portions of the stomach for tumours and ulcers, the only case of partial gastrectomy on record is that of Kolaczec, who successfully removed a diverticulum of the stomach wall. (2) *Total Gastrectomy:* The recent case of Schlatter was the first case on record in which it was proved that the *whole* of the stomach had been removed. The case was one of cancer; microscopic examination of the portion removed showed œsophageal epithelium at one end of the specimen and duodenal epithelium at the other end. The patient made an excellent recovery, and the digestive functions were fully restored. Since this case two others have been reported in America; one died thirty-six hours after the operation, the other was well after an interval of six weeks. In addition to these there are several cases on record in which

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practically the whole stomach has been removed. Altogether there are twelve cases, six of which recovered, five died, and in one the result is unknown.

Gastric Ulcer.—The surgical treatment of gastric ulcer is of very recent origin. The first operation for non-perforating ulcer was performed by Czerny in 1882. The first recognised perforating ulcer which was sutured dates back to 1880, but the first successful case did not occur until 1892. In 1896 Weir and Foote collected 78 cases, and Tinker, one of the author's assistants, has collected 78 further cases, which have been published during the last few years. From the statements of various observers it would appear that perforation is very much more common on the anterior than on the posterior wall of the stomach. This is probably due to the fact that, owing to the respiratory motion of the stomach and abdominal wall, adhesions do not readily form anteriorly, whilst on the posterior wall they occur very frequently. Further, when ulcers do perforate on the posterior wall, they are apt to result in localised subphrenic abscesses rather than in general peritonitis. In operating upon these cases it must not be forgotten that there is not infrequently more than one gastric ulcer.

I.—*The Treatment of Non-perforating Ulcer.*—In the great majority of cases this is purely medical. To the small but important number of cases which do not yield to medical means, three surgical methods of treatment are open. The first two of these are pyloroplasty and gastro-enterostomy. The object of both is to put the ulcer as far as possible at rest. The third method is excision of the ulcer. A number of cases in which excision has been carried out are mentioned, and the author refers at length to a case in which he excised an ulcer from a woman, aged 61. At the time he thought that it was a localised carcinoma, but subsequent examination proved that it was a simple ulcer. The operation was performed in 1892, and six years later the patient was in excellent health. Almost every case on record of partial gastrectomy for non-perforating ulcer has been followed by success. In view of this fact, and considering the dangers of ulcer—malnutrition from constant vomiting and pain, hæmorrhage, and occasional malignant degeneration—the author thinks that in cases of gastric ulcer which do not recover in a reasonable time under medical treatment, the question of excision of the ulcer should be carefully considered. "The danger to life from gastric ulcer," says Mikulicz, "is at least not less, but probably far greater, than the danger of a complete modern operation."

II.—*Operation for Hæmorrhage from Ulcer of the Stomach.*—Hartmann, who collected twelve cases of operation for this condition, eight of which died, says that, considering that the hæmorrhage can

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usually be stopped by other means, it is well to abstain from operative interference in cases of hæmatemesis with acute anæmia.

III.—*The Treatment of Perforated Gastric Ulcer.*—The author agrees with Mikulicz, Barker, and Thompson in urging that operation should not be delayed in these cases in the hope that shock will pass off: the shock will only pass into a fatal peritonitis. Moreover, the results of immediate operation are very much more favourable than those in which the operation is delayed. The abdomen is opened by an incision in the median line or on the left side. The stomach having been exposed, a methodical search for the ulcer is begun. In some cases the injection of air through a stomach-tube may assist in finding the perforation. The methods of dealing with the perforation are various. In some cases its edges have been pared and sutured; in other cases the edges have been merely inverted and the stomach-wall sutured by one or two rows of Lembert's sutures. Sometimes it is impossible to carry out the above by reason of the thickness of the walls of the stomach, of surrounding adhesions, or of the size of the opening. Three courses are then open: The edges of the opening may be brought into contact without inversion, as in suturing a cutaneous wound, or the opening may be closed by an omental graft, or the intestines may be walled off by iodoform gauze and a tube introduced down to the open ulcer. In all cases the operation should be completed by careful cleansing of the peritoneum.

The author gives a table of the 78 cases of operation for perforated gastric ulcer which were collected by his assistant, Dr. Tinker, and compares these cases with the 78 collected by Weir and Foote in 1896.

The following are the chief points which are mentioned:—

(1) *Age and Sex.*—Of Keen and Tinker's 78 cases, 9 were men and 61 women; in 8 cases the sex was not recorded. All the men were over 25 years of age. Of the women, 41 were under 25 and only 16 over that age. The age was not stated in four cases.

(2) *The Site of Perforation* was in the following situations in decreasing order of frequency: on the anterior wall; near the cardia; near the lesser curvature; near the pylorus, and on the posterior wall.

(3) *Ulcers Not Found.*—The number of cases in which the ulcer was not found at the time of operation has been very much less in recent cases than in those reported a few years ago. This has been partly due to the fact that more recent operators have had less hesitation in breaking down adhesions.

(4) *The Mortality* has been progressively reduced. Of Weir and Foote's cases, 55 died and 23 recovered, giving a mortality of 70·51 per cent. Of the cases collected by Keen and Tinker, 28 died and 50 recovered, a mortality of 35·89 per cent.

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(5) *The Mortality in Relation to Time of Operation.*—An analysis of the 156 cases shows the following:—

Time of Operation after Perforation.	Total.	Died.	Recovered.	Percentage of Mortality.
Under 12 hours	49	14	35	28·57
12 to 24 hours	33	21	12	63·63
24 to 48 hours	27	21	6	77·77
Over 48 hours	33	17	16	51·51
Not stated	14	10	4	...
Total	156	83	73	53·20

The evident conclusion is that, if we wish to have any reasonable prospect of recovery, the case must be operated on within the first twelve hours, and practically the earlier the better.

The paper is illustrated by a large number of drawings of the various operative procedures. *J. E. Platt.*

CHIPAULT (A.). "Sur une série de douze craniectomies."—*Gazette des Hôpitaux*, May 26, 1898.

THE author gives in the present article an analysis of twelve craniectomies, deserving, he thinks, of special notice, either on account of the indications for operation or on account of the ultimate results obtained.

Seven cases were operated on for tumour, one for localised meningitis, one for infantile spastic hemiplegia, and three for injury received early in life.

(1) *Craniectomy for Tumour.*—Although records of four hundred operations of this nature have been recorded, the author's series of seven is, he thinks, the most extended list in French literature. In four of the cases the tumour was diagnosed as irremovable, and the operation was undertaken purely for the relief of symptoms. One case died of shock following an extensive resection of the occipital bone for tumour of the cerebellum. A second case of glio-sarcoma, with very extensive ramifications towards the base of the brain, was not benefited. In the other two cases the result was very satisfactory. One was a diffuse glioma of the left temporo-sphenoidal region, and the other a tumour, probably tubercular, involving the left cerebellar peduncle. In both, relief of headache, vomiting, and vertigo, with

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decrease of the neuritis, followed the craniectomy. A notable feature was that in either case the relief coincided with the formation of an encephalocele at the site of operation, the secondary tumour attaining the size, in one instance, of a large orange.

In three cases the operation was begun with the idea of extirpating the tumour, and in two of them no tumour was found. In one of these a sub-cortical glioma of the second frontal convolution was diagnosed, but operation neither discovered the tumour nor relieved the symptoms. In the other case a tubercular growth of the cortex of the right paracentral area was suspected, but, in spite of the introduction of the finger in two directions, even as far as the lateral ventricle, nothing was found. However, the symptoms, which were exceptionally severe, were all much relieved, and, in fact, disappeared before death, which took place two months later from phthisis. Two fine linear traces of hæmorrhage constituted the only post-mortem evidence of the exploration of the brain substance. No mention is made of the finding of any tumour at the examination.

The third case of operation for growth diagnosed as removable was much more successful. The tumour was a large angioma of the pia-mater of the left Rolandic area. The operation was carried out in three stages. On the first occasion the cranium was resected: on the second the dura was incised all round the mass; and on the third the tumour, with the underlying cortex, was extirpated. The two latter stages only occupied fifteen and eight minutes respectively, but the hæmorrhage was most profuse, and was only arrested by gauze packing. The cure is reported as absolutely perfect, but the length of time which has elapsed since the operation is not given.

(2) One craniectomy for localised meningitis over the left Rolandic area gave an excellent result. The hemiplegia disappeared, and the pains and convulsions ceased. No history of the patient is given in this communication, but the good results have lasted for a year and a half.

(3) The operation for infantile spastic hemiplegia was followed by relief of the convulsive attacks alone.

(4) In three cases craniectomy was performed for injury received during infancy. The removal of thickened dura in a case with convulsions and contractures following injury at birth was followed by complete cessation of spasm. The second case was one of epileptiform seizures following depressed fracture of the parietal region in a child of two. The fits were relieved for a month only. The third case in this category was much more successful. Spastic hemiplegia with general convulsions followed an injury received by a girl three years old a year and a half before. Craniectomy revealed a mass of cicatri-

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cial tissue replacing the brain substance of the fronto-parietal area and extending to the lateral ventricle. This was in part removed, and the convulsions entirely ceased.

In conclusion, M. Chipault recommends that all operations on the brain should be done in two, or even more, stages, with a few days' interval between.

Jaboulay (M.). "Drainage des collections péritonéales par la voie rectale."—*Lyon Médical*, May 29th, 1898.

In cases of peritonitis in the male, Jaboulay remarks on the very great difficulty experienced in draining the pelvic pouch of peritoneum. In the female, of course, the pouch of Douglas can be drained by the vagina. Margery and Morestin proposed to make an opening in the roof of the ischio-rectal fossa; and Mauclaire also suggested, on anatomical grounds, the perineal drainage of the pelvic peritoneum.

Jaboulay points out that pelvic abscess often discharges itself naturally by the rectum, and suggests, as an alternative to these rather severe procedures, that the peritoneal cavity or the pelvic collection should be opened through the anterior rectal wall.

The operation, which would apply to the female in preference to a vaginal route, is performed in the following way. After dilatation of the sphincter and disinfection of the gut, the left index finger feels for the prostate and makes out the collection above it. The wall is then divided transversely by curved scissors passed along the finger, and the peritoneal cavity or abscess opened. If possible, the rectum is invaginated and the cut edges of the wound brought down to the anus and stitched there. This may not always be possible, but if it can be done, proctal or peri-proctal suppuration is much less likely to ensue. In any case a large drainage tube is passed up through the rectal wound and brought out at the anus.

The results in certain cases seem to be good. Four are reported in this paper, the cause of the suppuration being in all the appendix. In only one, however, does the peritoneal cavity itself appear to have been drained, and that one died. The others seem to have been localised pelvic abscesses.

The author does not think that the abscess can be infected from the rectum after the incision.

W. P. Montgomery.

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Midwifery and Diseases of Women.

UNDER THE CHARGE OF W. J. SINCLAIR, M.A., M.D.

GOENNER. "The value of alcohol as a disinfectant."—*Centralblatt für Gynaecologie*, No. 18, 1898.

NUMEROUS experiments were made with the object of determining the value of alcohol for practical use as an antiseptic and disinfectant.

In the first series of experiments cultures of various organisms (bacillus pyocyaneus, staphylococcus pyogenes, streptococcus pyogenes, etc.) were exposed to the influence of alcohol for varying intervals of five to ten minutes. The results showed that although a marked inhibitory effect on the growth was produced, increasing with the length of exposure, still the cultures were not destroyed, and remained capable of again manifesting active growth.

In a second series of experiments the hands were cleansed, as before an operation, in various ways. A portion of the skin from under the nail was then removed, and cultures, together with inoculations into animals, were made.

Briefly, the results obtained show that as a germicide alcohol is far inferior to perchloride of mercury. The streptococci, especially from virulent cultures, and the spores of other bacteria, are not destroyed. Staphylococci and bacillus pyocyaneus are killed by the use of alcohol.

In conclusion the author strongly advises the use of perchloride of mercury as a disinfectant of the skin. Alcohol may be used preparatory to insertion of the hands in the perchloride solution, but it must not be solely relied upon as an antiseptic.

GOUZARTSCHICK. "Capillary drainage of the uterus in puerperal endometritis."—*Journal d'Obstet. et de Gyn.*, February, 1898.

VARIOUS measures have from time to time been recommended in the local treatment of puerperal endometritis. At the present time the uterine douche is mainly relied upon, repeated, if necessary, at frequent intervals, together with curettage and various applications to the endometrium.

In this paper the author recorded 115 cases of puerperal endometritis treated by the continued drainage of the uterus with gauze tampons. The procedure is as follows: The cervix is exposed by a

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speculum and seized with volsella. The uterine cavity is swabbed out with perchloride solution. A tampon soaked in the same solution is now carried to the fundus uteri by sponge forceps. The vagina is now packed with iodoform gauze. Each tampon remains for 24 hours, when it is removed and a fresh one inserted. If the temperature rises the tampon is removed earlier and a fresh one inserted. The average length of treatment is ten days. All the cases so treated recovered with one exception. The author claims the following advantages for this method:—(1) It is easily applied; (2) all the necrotic tissue is removed on withdrawing the tampon; (3) the tampon acts as a capillary drain, thus favouring the escape of all discharge from the uterine cavity.

The writer then proceeds to review the other methods of treatment, and claims that their use is by no means free from risk.

The only contra-indication to this mode of treatment is the presence of inflammation of the appendages or cellular tissue of the pelvis.

PINARD. "On appendicitis and its connection with the puerperal state."—*Annales de Gynécologie*, April, 1898.

A CONSIDERABLE amount of attention has of late been directed to this subject, and numerous cases of appendicitis complicating pregnancy have been reported.

In this paper M. Pinard relates a case under his own observation, and furnishes, also, a table of cases recorded up to the present time.

The patient, aged 25, was six months pregnant when she was seized with the typical symptoms of acute perforative appendicitis. Signs of general peritonitis rapidly ensued. M. Segond made an incision over the cæcal region in the usual way. Pus was found free in the peritoneal cavity surrounding the uterus and extending into the left iliac fossa. A similar incision was therefore made on the left side, sero-purulent fluid being evacuated in large quantity. The peritoneal cavity was flushed out and gauze drains inserted. The same morning premature labour came on, the fœtus being expelled naturally. The patient, however, died within 12 hours. Post mortem two perforations were found in the appendix, and the uterus was surrounded by numerous recent adhesions.

The blood of the fœtus was cultivated, and furnished pure cultures of bacillus coli commune, and it may be fairly assumed that this organism was the cause of the fatal peritonitis, although cultures were not made from the maternal tissues.

The analysis of 45 cases shows the gravity of appendicitis complicating pregnancy. Of these 30 were operated upon, giving a maternal

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mortality of 33 per cent, and an infantile mortality of 36 per cent. Fifteen cases were not operated upon; of these two mothers died, giving a mortality for mother and child of 13 per cent. In some instances appendicitis has occurred in the early months of pregnancy; in others it has arisen at the end of the puerperal period If it occurs before the end of pregnancy the expulsion of the fœtus is the rule. The child is often born dead, or dies in a few days with signs of septicæmia, probably due to infection by the bacillus coli commune. All the types of appendicitis have been met with during pregnancy, and the diagnosis may at times be very difficult.

With regard to treatment, M. Pinard urges that operation should be undertaken earlier even than in cases where pregnancy does not exist.

BEGONIN (P.). "On puerperal pseudo-rheumatism and its identity with gonorrhœal rheumatism."—*Annales de Gynécologie*, February, 1898.

A VERY complete account of this somewhat rare affection is given in this paper, based upon a study of 42 observations, collected, for the most part, from various authors. It probably occurs not oftener than once in 600 labours, so that many women with gonorrhœa during the puerperium are not affected. The symptoms may come on at any time during pregnancy, oftener, however, in the late months. After delivery arthritis may appear in a few days. In cases arising some months after delivery it is probable that a fresh infection has occurred. In all the cases there is a history of profuse leucorrhœa during pregnancy. The arthritis may commence—(1) As a hydrarthrosis of one joint, with slight pain and rigidity; (2) multiple articular pains with swelling of several joints; (3) arthritis of a severe type, limited to one joint, which may be the only one affected. Slight fever is present at first, which soon subsides. The larger joints, especially the knees and shoulders, are commonly involved. The joint becomes swollen, and the skin red and tender. Very slight movement causes severe pain, and there is a great tendency for ankylosis to occur. The diagnosis of the gonorrhœal nature of the affection is made by the character of the arthritis, and also by a careful investigation of the history of the case, especially with regard to the evidence of gonorrhœal infection of the vagina, urethra, etc., and the possible occurrence of ophthalmia in the infant. Gonococci may be found in the fluid removed from the affected joints.

It must be distinguished from ordinary articular rheumatism, which usually involves many joints, is accompanied by pyrexia and

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profuse sweats, and yields rapidly to salicylate treatment; also from septic, gouty, syphilitic, and tubercular affections of the joints. The prognosis is grave with regard to the restoration of mobility of the joint. Complete recovery was only obtained in 26 per cent of the cases. Very rarely pus may form in the joint.

The puerperal period does not appear to have any influence on the development, the course, or the prognosis of gonorrhœal rheumatism. It is also doubtful if suckling the child has any material effect on the disease.

The treatment is not very satisfactory. Drugs, such as salicylate of soda, quinine, and potassium iodide are of very slight benefit. Locally, the most valuable measure is absolute fixation of the joint in a favourable position should ankylosis unfortunately occur. This treatment absolutely relieves the pain and promotes complete recovery. In exceptional cases, if fluid collects in the joint, aspiration of the fluid, or even aseptic drainage may be indicated.

It is also of essential importance to treat any signs of local gonorrhœal infection of the genito-urinary tract.

Arnold W. W. Lea.

Pharmacology and Therapeutics.

UNDER THE CHARGE OF D. J. LEECH, M.D., D.Sc., F.R.C.P.

WALLER (AUGUSTUS D.). "Remarks on the dosage of chloroform."—*British Medical Journal*, April 23rd, 1898.

IN a paper published in *Brain* (1896), and abstracted in the MEDICAL CHRONICLE (January, 1897), Dr. Waller showed that it is possible to test the influence of certain drugs upon living nervous tissue by utilising the "negative variation" as an index of the vitality and functional activity of the nerve.

The present paper, communicated to the Society of Anæsthetists, is a practical application of these experimental results to the question of the safest method of administering chloroform for operative or other purposes, and Dr. Waller formulates certain important conclusions bearing upon the cause of death from chloroform.

The uniform result of his experiments during the last few years has been the conviction that *quantity* is the all-important factor in anæsthesia by chloroform and in death by chloroform. A number of tracings are given, showing the effect upon a nerve of mixtures of chloroform vapour and air in strengths of from one to ten per cent.

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Chloroform at one per cent is excitant; at two per cent, three per cent, and four per cent the anæsthetic effect is more and more pronounced in proportion to the dose. At five per cent there is a well-marked anæsthetic effect and not quite perfect recovery; at 5·6 per cent the recovery is slight and imperfect; at ten per cent there is no recovery, the nerve dying rapidly. From the results of a number of experiments five per cent seemed to be the limit of strength beyond which a nerve could not be safely anæsthetised.

Now it so happens that five per cent is the limit that was fixed by Snow forty years ago as regards anæsthesia of the human subject by chloroform vapour and air, and this coincidence led to a closer examination of Snow's data concerning the percentages of chloroform vapour required in the air and fluids of the body for anæsthesia of various degrees. From a calculation based upon a consideration of the volume of vapour derived from a volume of chloroform at the ordinary temperature, the estimated volume of the fluids of the body, and the co-efficients of absorption for chloroform vapour in the pulmonary air and blood at the body temperature, the author draws up the following table, as showing the quantities and percentages at which chloroform vapour is to be maintained in the surgical anæsthesia of a normal subject, assuming Snow's dicta of 18 minims of chloroform in the blood for surgical anæsthesia, and 36 minims to arrest the function of respiration:—

1 ccm. of fluid chloroform = 300 ccm. of vapour.

	Anæsthesia.	Death.
Absolute volume of vapour in the blood and lymph.	300 ccm.	600 ccm.
Percentage of vapour in the blood and lymph.....	2·00 per cent...	4·00 per cent
Degree of saturation of vapour in the blood and lymph	0·02 per cent...	0·04 per cent
Degree of saturation of vapour necessary in inspired air	0·02 per cent...	0·04 per cent
Percentage of vapour in inspired air, corresponding with these degrees of saturation.....	0·80 per cent...	1·60 per cent
Quantity of vapour per respiration at 375 ccm. required to produce these percentages	3 ccm.	6 ccm.
Quantity of vapour per minute at 20 respirations, that is in 7,500 ccm.	60 ccm.	120 ccm.
Quantity of fluid per minute at 20 respirations, that is in 7,500 ccm.	0·2 ccm..... = 3·4 minims	0·4 ccm. = 6·8 minims

For continuous administration Snow's limit of five per cent is dangerously high, and, as a matter of fact, he names it as a high limit, and did not aim at its continuous exhibition; in his experiments on animals the percentages by continuous administration of which

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anæsthesia was produced show that less than ·77 per cent of chloroform vapour in air was not enough, between ·96 per cent and 1·5 per cent was enough, and above 1·7 was too much.

The experiments of Paul Bert and Dubois in France, when analysed, lead to the same conclusion, viz., that between one and two per cent of chloroform vapour in air is essential for anæsthesia.

From these considerations the following conclusions are drawn:—

(1) That chloroform vapour is in itself a certain and uncapricious agent, producing effects more and less pronounced in gravity, according as it acts in greater or smaller quantity.

(2) That anæsthesia requires the continuous administration of a mixture of chloroform and air, at an average percentage of 1·5—not below one per cent and not above two per cent.

This second indication has been met more or less perfectly by—(1) Clover's gas bag; (2) Paul Bert's gasometer; (3) Dubois' anæsthetic machine; (4) Junker's inhaler; (5) an "open method."

With regard to these methods, Clover's bag is cumbersome, the percentage is not susceptible of convenient and known alteration during administration, and the percentage (4·5 per cent) seems to have been too high for continuous administration.

Bert's gasometers are still more cumbersome, and the distribution of the chloroform in the air is not uniform, but may be below two per cent in the upper and above two per cent in the lower strata.

Dubois' machine, in which, by means of a plunger dipping into a flask of chloroform, more or less fluid is volatilised at each stroke of a piston which delivers a given volume of air, appears theoretically excellent, but the author has no information as to the results of its regular use.

The choice remains limited to either Junker's method or the "open method," and both these methods may, as regards quantity and percentage, be rightly or wrongly carried out. But whereas the Junker method is not likely to be wrongly applied, apart from gross ignorance, the open method is very likely to be wrongly applied in the absence of very considerable skill and experience. A nerve can be anæsthetised (as in the above experiments) by the open method, but not with the absolute certainty of a mixture of known percentage.

The Junker apparatus is adjusted to deliver 1 minim of chloroform at each stroke of the pump; 16 strokes of the pump deliver 1 ccm. of chloroform, equal to 300 ccm. of vapour, and this is carried off by 1,000 ccm. of air at a temperature of 65 deg. F. This apparatus was applied to the isolated nerve so as to produce successfully the required percentage of chloroform; a diagram is given of the apparatus used, and the tracings obtained, from ·5 per cent and two per cent of chloroform.

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The principles urged in this communication may be summarised as follows:—

(1) Chloroform is not an uncertain drug.

(2) The notorious uncertainty and danger in chloroform administration is an uncertainty in the quantity administered.

(3) The uncertainty of quantity administered can be most easily avoided by following the principle of Junker's method.

(4) The great danger of the "open" method is an overdose. Death is nearly always due to unskilful administration, and unskilful administration is the result of an overdose. The "open" method is more or less "open"; the administrator by the drachm, who closely surrounds his patient's mouth and nose, may easily get more chloroform vapour into the blood than does the administrator by the ounce, who keeps his evaporative fabric at a greater distance from the face; and drachms of chloroform, if they get into a patient's body quickly enough, will, with certainty, kill him—one drachm in one minute will more than suffice. For the experienced anæsthetist who uses the open method it is, perhaps, better not to change from a simple method with which he is familiar. An inferior method in skilful hands may give far better results than a superior method in unaccustomed hands. The open method, as practised on the average in England, stands condemned, and the remedy is to be sought, not by the wholesale rejection of chloroform as an anæsthetic, but in the right and proper valuation of its power, and in its quantitative administration.

R. B. Wild.

KRYOFINE.

EICHHORST. "Kryofin, ein neues Antipyreticum."—*Deutsche med. Woch.*, 1897, No. 17.

BRESLER. "Kryofin bei Influenza."—*Therap. Monatshefte*, Oct., 1897.

SCHREIBER (G.). "Ueber Kryofine."—*Deutsche med. Woch.*, Nov. 4, 1897.

HAAS (S. V.) and MORRISON (J. B.). "A clinical study of kryofine."—*New York Medical Journal*, March 26, 1898.

CURTIS (J. H.). "Kryofine."—*Therapeutic Gazette*, May 16, 1898.

PHENACETIN is chemically para-acet-phenetidin—that is, the acetic acid compound of ethylated para-amido-phenol, and its constitution is expressed by the following formula:—

$$C_6H_4 < \begin{matrix} O \cdot C_2H_5 \\ NH.C_2H_3O \end{matrix}$$

From the researches of Ostwald ("Ueber die affinitätsgrössen organischer Säuren."—*Zeitschrift für physikalische Chemie*) it appears

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that the chemical affinities of the alkyl glycollic acids are stronger than of glycollic acid itself, and still stronger than in the case of acetic acid. These considerations led Dr. Bischler, of Zurich, to build up a compound related to phenacetin, but containing methyl glycollic (methoxyacetic) acid instead of acetic acid.

This compound has been called "kryofine," and it is obtained by heating *p*-phenetidin with methoxyacetic acid at 120°—130° C. Thus—

$$\underset{\text{Methoxyacetic acid.}}{CH_3\,O{\cdot}CH_2\,CO{\cdot}OH} + \underset{\text{P-phenetidin.}}{C_6H_4{<}\begin{matrix}O{\cdot}C_2H_5\\NH_2\end{matrix}} = \underset{\text{Kryofine.}}{C_6H_4{<}\begin{matrix}O{\cdot}C_2H_5\\NH{\cdot}CO.\,CH_2.\,O{\cdot}CH_3\end{matrix}} + H_2O$$

Chemically, then, kryofine is methoxyacetic acid para-phenetidin. It forms white crystals melting at 98°—99° C. In moderate doses it is tasteless, but in doses exceeding 15 grains it produces, after a few moments, the sensation of chewing willow bark. It is soluble in boiling water 1 in 52, in cold water 1 in 600. It is soluble also in alcohol, ether, chloroform, and in oils such as poppy and olive, also in glycerine. By boiling with caustic potash under similar conditions only 10 per cent of phenacetin was saponified, as compared with 60 per cent of kryofine. With hydrochloric acid a similar difference in chemical activity was observed, kryofine being more completely saponified than phenacetin. The acid gastric juice, therefore, and the alkali in the duodenum will split up kryofine more readily than phenacetin.

Now, Treupel and Hinsberg, as a result of their experiments in regard to antipyretic action (*Archiv für Exp. Pathologie und Pharmakol.*, Bd. XXXIII., p. 216, and *Centralblatt für innere Medicin*, March 20, 1897), have laid down the law that "the antipyretic action of the anilin and amidophenol derivatives is therefore, within certain limits, as far as can be seen up to now, proportional, or almost proportional, to the amount of *p*-amidophenol or *n*-acidyl-amidophenol split off in the organism."

Bischler therefore concluded that kryofine would probably be a more powerful antipyretic than phenacetine.

Eichhorst tried it chemically with success in typhoid fever, pneumonia, puerperal sepsis, post-scarlatinal febrile hæmorrhagic nephritis, and erysipelas. He details cases in which kryofine, usually in 7½-grain doses, produced considerable fall of temperature, lasting for several hours. He did not observe any dangerous secondary effects. In one patient he noticed profuse perspiration during the fall of temperature. Now and then cyanosis was observed. He found that under kryofine the blood pressure was raised, the pulse became stronger, and dicrotism disappeared. He found the drug act well as an anti-neuralgic

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in some cases of alcoholic peripheral neuritis. In some cases of recent sciatica its rapid action was almost startling.

Bresler had an opportunity of trying kryofine in an epidemic of influenza. The cases showed a great uniformity in the symptoms—general weakness, pains in the head, back, and limbs, catarrh of the naso-pharynx and bronchi, orbital and frontal oppression, loss of appetite, sometimes vomiting, labial herpes, etc. The kryofine treatment was instituted after the epidemic had been some days in progress. As a precaution, he began with a dose of 7½ grains, and increased it to 15 grains, and administered it either in a wafer or placed on the tongue. In some cases he also gave phenacetin and antipyrin. Bresler gives tables of 16 cases, showing the effect on the temperature. He believes that it is evident from these tables that the action of the kryofine is one opposed to heat production. The subjective troubles were mitigated by the kryofine as well as the fever. Sweating was observed once, and in a nervous, weakly patient cyanosis lasting a few hours was seen after a dose of 15 grains.

Schreiber states that the lethal dose of kryofine for a mouse amounted to 0·2 gram (3 grains), and for medium sized 13 grams (201 grains), death occuring with general paralysis and extreme slowing of the respiration and pulse. The kidneys showed nothing pathological. In healthy men large doses, up to 75 grains, caused no disagreeable subjective sensations. Sometimes, however, after doses exceeding 15 grains, cyanosis came on, which lasted some hours, and was accompanied by diminished frequency of respiration without dyspnœa.

Once in a girl, twenty years old, Schreiber observed marked sweating.

In a case of advanced phthisis in an elderly woman, after 7½ grains of kryofine, the temperature fell rapidly from 38·8° C. to 34·6° C., and collapse came on, with cold, damp cyanotic extremities. This lasted a day, and then the patient recovered somewhat, but died on the third day. Schreiber, therefore, urges caution as regards the dose in weak patients with a high temperature.

Schreiber found kryofine useful as an anti-neuralgic in headaches, which usually disappeared quickly under the use of the drug.

Uræmic headaches and headaches due to syphilis with periostitis were favourably influenced. In cholelithiasis and in trigeminal neuralgia the drug proved useless.

No influence was observed as regards diuresis, even on giving kryofine in large doses, 45 grains daily for several days.

Neither albumen nor sugar were ever found in the urine as a result of the administration of the drug. The urine, which in most cases has a reddish colour, darkens very little on standing. The colouring matter

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can be separated only very slightly by shaking the urine with the usual re-agents, such as chloroform, benzol, ether, etc. The urine gives no distinct bands in the spectrum, certainly not that of methæmoglobin.

Kryofine may be found in the urine fifteen to twenty minutes after its ingestion. After six hours it has completely disappeared.

With perchloride of iron, urine containing kryofine gives a brown-red coloration, which is produced immediately if the proportion of the drug is large, but only slowly if traces merely are present. The reaction is very clear if a few drops of liquor potassæ are added to the urine, and then a little perchloride of iron; on filtering the filtrate is red.

The acidified urine gives Ritsert's reaction for phenacetin—a brown coloration when three or four drops of a 3% solution of chromic acid are added to 2 cc. of the acid urine. The urine gives also the following reactions :—

(1) To the urine acidified with 2 drops of hydrochloric acid 2 drops of a 1 per cent solution of nitrite of sodium are added, and some drops of an aqueous alkaline solution of α-naphthol, then rendered alkaline by liquor potassæ; a red colour develops, passing into violet on the addition of hydrochloric acid.

(2) If 10 cc. of the urine are boiled with 1 or 2 cc. of concentrated hydrochloric acid, and on cooling 3 to 5 drops of a saturated aqueous phenol added, a fine indophenol reaction is obtained.

All these reactions lead to the conclusion that the urine, after the ingestion of kryofine, contains phenetidin and para-amidophenol.

Dr. Haas and Dr. Morrison report on an extended trial of kryofine during four months at the Mount Sinai Hospital, New York, in the service of Dr. Rudisch, Dr. A. Meyer, and Dr. A. G. Gerster. They consider kryofine to be an excellent antipyretic, comparing favourably with other coal-tar products. It reduces temperature gradually, attaining its maximum effect in from three to six hours. As an analgesic it has given excellent results in the treatment of headache, from whatever cause. In sciatica it has proved effectual in some cases. In relieving the malaise of acute febrile conditions, nothing they have used has produced such favourable results. As a hypnotic in insomnia, unaccompanied by severe pain, it has proved of value. Kryofine reduces the pulse-rate with the temperature, acting practically without cardiac depression. In only two of their 150 cases were any collateral symptoms noticed. The first was a woman, aged 19 years, suffering from typhoid fever, with lobar pneumonia, accompanied by severe delirium. Here, after the administration of 22½ grains in divided doses at three hours' intervals, cyanosis appeared, with coldness of the skin, and a rapid pulse, requiring stimulation. In another case, a woman of 50, with advanced pulmonary phthisis, complicated by appendicitis, in whom debility was

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extreme, after the ingestion of 50 grains in divided doses, symptoms of collapse, lasting two hours, appeared, but were not followed by any bad effects.

Upon the kidneys no ill effects were observed, even in cases of acute and chronic nephritis.

The drug was given in doses ranging from 2½ grains to 25 grains. The maximum amount administered in 24 hours was 60 grains. It is best given in tablets, wafers, capsules, or dry on the tongue.

The drug was given for its antipyretic, analgesic, or hypnotic effects in a series of about 150 cases, including typhoid fever, intestinal self-intoxication, malaria, pneumonia, acute bronchitis, dry pleurisy, phthisis, empyema, acute and chronic endocarditis, pericarditis, septicæmia, pyæmia, acute and chronic nephritis, osteomyelitis, coxitis, post-operative septic cases, gastritis, fæcal impactions, pruritus with insomnia, anæmia, hysteria, neuritis, and trifacial neuralgia. The fact that kryofine was successfully used for the lowering of temperature and relief of restlessness in acute and chronic endocarditis and pericarditis, without any manifestation of depression, speaks well for the action of the drug on the heart.

The conclusions drawn by Haas and Morrison are as follows: "As an antipyretic, while not reducing the temperature so rapidly nor so markedly as the other coal-tar products, it is certainly very efficacious, at the same time being a safer remedy than the other members of the group, and its diaphoretic action being much less marked. As an analgetic it is at least equal to the other members of the group, with the advantage that it is sometimes effectual when the others have failed. As a hypnotic, when insomnia is due to causes other than that of severe pain, it is of decided value, and probably superior to the other members of the group."

Dr. Curtis has been using kryofine for about a year. He finds it controls neuralgic pains in a marked, and sometimes almost magical, manner, and in some persons produces a tendency to sleep. Perhaps its chief value will be as an analgesic. For the adult, 8 grains seems to be the dose giving best results. In only one case did Dr. Curtis see any objectionable collateral symptoms. In a case of lobar pneumonia, with very high temperature, 10 grains every six hours produced some cyanosis of the lips and finger-tips, which, however, disappeared in a few hours.

Dr. Curtis gives details of ten typical cases illustrating the good results he has obtained with the drug. The cases he mentions include follicular tonsillitis, influenza, pneumonia, and neuralgic pains.

He has also given the drug in some cases of typhoid fever. Although he has used kryofine in pneumonia, he is of opinion that, "except in

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occasional cases, the use of agents that reduce temperature by lessening the oxygen-carrying capacity of the blood is not good therapeutics in lobar pneumonia."

Dr. Curtis concludes that kryofine is a "prompt and safe antipyretic, unusually free from unpleasant collateral effects," and an analgetic "of great power and rapidity of action in all cases of neurotic character." He considers the best method of administration is to give the powder dry upon the tongue. *Francis J. H. Coutts.*

JOACHIM. "The action of somatose on the mammary glands of nursing mothers."—*Centralblatt für Innere Medicin*, No. 10, 1898.

DREWS (*Cent. f. Inn. Med.*, No. 23, 1896) made experiments in 1896 which led him to conclude that somatose has a specific action on the mammary glands of nursing women, that it produces a rich secretion of mother's milk, and rapidly checks commencing failure of the supply of that fluid.

Lewy (*Medico*, No. 51, 1896), Liebe (*Kinderarst.*, No. 86, 1897), and Lutaud (*Journ. de Méd. de Paris*, No. 15, 1897) confirmed these statements.

Joachim's doubts as to the value of the above experiments were lessened by some more or less favourable trials made by himself, and he became convinced that, in certain cases, somatose does both increase the quantity and improve the quality of mother's milk. He believes, however, that these results are brought about indirectly, and not by any specific action upon the mammary glands; for it was in cases where the patient's nutrition was improved, that the milk became richer and more abundant. Fifteen observations were made, three of which are given in detail as examples. In the majority of the cases there was improvement in appetite and in general condition, together with increased quantity and better quality of milk. In the minority somatose was given long and regularly without any result. The author suggests further experiments with the view of showing whether somatose, given during the later months of pregnancy, has any effect upon the secretion of milk after parturition. *W. E. Fothergill.*

RENAUT (J.). "Note on rectal administration of arsenic."—*Bulletin Général de Thérapeutique*, April 8, 1898.

THE administration of arsenic by the rectum was introduced by Vinay, in 1896, in order to avoid the gastric irritation produced when this drug was given by the mouth, or the formation of abscesses when given subcutaneously, as recommended by Ziemssen. Vinay gives 5cc. of the following mixture:—Fowler's solution 4 grammes, distilled water 56

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grammes, two or three times a day. In the latter case 1 gramme of Fowler's solution is injected daily, an amount which could not be tolerated in the stomach more than a few days. Rectal injections, on the other hand, can be continued for weeks, and in many cases even for months.

This method of treatment has been used in tuberculosis, diabetes, and Graves' disease.

In incipient tuberculosis, the method is combined with forced feeding (suralimentation); for the first five days injections are made twice daily, for the next five days three times daily, for the succeeding five days four times daily; then an interval of five days is allowed to elapse without injection, after this the series is commenced again. After six months to a year's treatment marked benefit is obtained. In confirmed phthisis the treatment was less efficacious; chronic and diffuse lesions are but little affected, but restricted lesions are sometimes benefited. In diabetes distinct benefit was also obtained; in the case of a woman of sixty subjected to five weeks' treatment with these arsenic injections, improvement was shown as follows:—

	Beginning.		End.	
Amount of urine.....	3,875	grammes	2,550	grammes.
Glucose.....	111	„	65·30	„
Albumin	5·710	„	2·493	„
Phosphoric acid	4·208	„	3·67	„
Urea	47·18	„	33·78	„
Chlorides	16·94	„	8·97	„

There was also a decrease of renal casts.

In the case of diabetics, a rest of two weeks is recommended. After five weeks' treatment the injection should be recommenced if there is a further increase of sugar in the urine.

Exophthalmic goître is also benefited by arsenic. Renaut suggests that this is due to an action on the central nervous system, which he considers is also present in the case of diabetes and tuberculosis.

E. B. Leech.

Greenish (H. G.). "Pharmacy of cantharides."—*Pharmaceutical Journal*, March 12, 1898.

It is very desirable that preparations having the same name should always contain the same amount of active ingredients. But it has long been known that many of those used by medical men differ not a little, according to the source of the drug and certain details in their manufacture. The object of Professor Greenish's paper is to point out the means by which uniformity of strength of the active ingredient in each of the official preparations of cantharides can be secured. The Spanish

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fly contains only one active substance, cantharidin, and it is to the presence of this substance that the various preparations of cantharides owe their efficacy. But the amount is so small that accurate determination in individual specimens is difficult, and it would not be possible to standardise them by simply finding the amount each should contain. Greenish holds that the only feasible plan to obtain uniform preparations is to prepare them from the active principle, cantharidin, which can be easily separated on a large scale. In his experiments, he first made the various official compounds from cantharides of good quality, and then determined the amount of cantharidin in each. He points out the curious fact, viz., that it is impossible to prepare the acetum cantharides according to the directions given in the Pharmacopœia of 1885, and states that the charta epispastica is an exceedingly unsatisfactory preparation. (In the new Pharmacopœia the forms for making acetum cantharides and the charta epispastica are omitted.) Having determined the quantity of cantharidin in good preparations of cantharides by processes which he describes minutely, and some of which are new, he then suggests formulæ for the various preparations now in the Pharmacopœia, which are to be made not directly from the Spanish fly but from cantharidin which has previously been extracted from cantharides, and it may be from other substances which yield it—for example, Telini fly.

The following table shows the amount of cantharidin which he suggests should be present in each preparation, as compared with the amount which he found in the standard preparation he made :—

	Found in standard preparations.	Proposed strength.
Emp. calefaciens	1 in 5,454	1 in 5,000
Emp. cantharides.....	1 „ 1,500	1 „ 1,000
Liq. epispasticus	1 „ 588	1 „ 300
Tinct. cantharides	1 „ 12,963	1 „ 10,000
Ung. cantharides	1 „ 2,653	1 „ 3,000
Acetum cantharides.....	——	1 „ 2,000

Formulæ for each of the above preparations are given which yield substances in characters similar to those in the Pharmacopœia, but having the advantage that they can always have a definite strength, and not vary in power, like the official preparations. *J. Grier.*

"Acetate of thallium in the night sweats of phthisis."—*Bull. gén. de Thérap.*, May 30, 1898.

Combemale, of Lille, has treated thirty cases of phthisis in patients troubled with abundant night sweats with acetate of thallium. In one case only has the drug failed to ameliorate this condition. The daily dose recommended by M. Combemale

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is 1½ grains, rarely 3 grains. He never gives it more than four days in succession, and finds it best to administer it in pill form about an hour before the time expected for the onset of the sweating.—*Acad. de Méd.*, February, 1898.

"Treatment of tinea tonsurans."—*New York Medical Journal*, May 14, 1898.

Dr. Hermann B. Sheffield claims that by his method "every case of ringworm of the scalp can and will be cured within three to six weeks," provided the directions he gives are strictly adhered to. He uses the following mixture:—

℞ Acidi carbolici, Olei petrolei ää..... 65·0
Tinct. iodini, Olei ricini ää..... 110·0
Olei rusci (German) q. s. ad..... 500·0

After clipping the hair close to the scalp, this mixture is applied over the entire scalp—more thickly over the affected spots—by means of a painter's brush, once a day for five successive days. On the sixth day it is wiped off with a rag dipped in plain olive oil. Now the hair is clipped again and the scalp washed thoroughly, but gently, with green soap and a *soft* nail-brush, care being taken that all the scales and loose hair covering the scalp are removed. No epilation is, as a rule, necessary. On the seventh day the mixture is reapplied as thickly as before, and the whole process is repeated regularly for three or four successive weeks—the length of time depending on the severity of the case—when it is found that new hair begins to appear, and no tricophyton fungi can be discovered in the hair epilated for microscopical examination.

These procedures are followed by a few days' application of a 10 per cent sulphur ointment, and then by the use of the following preparation for about two weeks:—

℞ Resorcini, Acidi salicyli ää..... 16·0
Alcoholis..... 120·0
Olei ricini q. s. ad..... 500·0

This mixture considerably hastens the growth of the hair on bald spots.

The author believes that this resorcin mixture, superficially applied to healthy heads when isolation is impossible, will prevent the spread of infection.

"Unusual symptoms following the administration of antifebrin."—*Medical News*, June 18, 1898.

Dr. P. V. Ballou records a case of a man, aged 45, suffering from a form of intermittent fever. The patient complained of almost unbearable headache; pulse, 120; respirations, 23; temperature, 104·8° F. Ten grains of antifebrin were given, and about twenty minutes later the patient said his headache was relieved, and that he felt easier than at any time since the previous evening. About forty-five minutes after the drug was administered all sweating ceased, and a peculiar sensation of warmth under the skin was complained of. To this, in twelve or fifteen minutes, was added intense itching, while in three or four more minutes the whole body presented a general erythematous condition. The entire surface was of a brighter red than that of a typical case of scarlet fever, and, like the scarlatina rash, it disappeared on pressure, to return as soon as pressure was removed. No part of the body was exempt from this rash, the conjunctivæ, palms of the hands, and soles of the feet

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being as red as any part of the body. The temperature of the surface seemed elevated, but the thermometer in the mouth showed that it was gradually falling. The body appeared as if every superficial capillary was dilated, and an increased quantity of blood was rapidly flowing through each.

With the appearance of the rash the itching became more intense, the patient assuming all positions possible while scratching. Within the external ear the itching was especially intense, but there was no disturbance of hearing.

The rash lasted for six hours, without any apparent change, and then disappeared rapidly from all parts of the body simultaneously, and as the rash faded the itching subsided.

About the time the rash disappeared a slight cardiac irregularity became evident, and this lasted for four days. The only drug taken before the antifebrin was a single dose of calomel (about 5 grains).

"Poisoning by sulphate of pelletierine."—*Lyon Méd.*, July 3, 1898.

At a meeting of the Société de Médecine, M. Crolas reported that he and M. Boyer had made an autopsy on a man of 34 years of age, who had died in a comatose condition some hours after having taken a dose of 0·50 centigrams (7½ grains) of sulphate of pelletierine. Strychnine poisoning was suspected, but MM. Crolas and Boyer were able to prove that sulphate of pelletierine had been administered, finding the salt in the viscera.

It was stated that the patient was an epileptic, and M. Crolas considers epilepsy as a contra-indication to the use of pelletierine.

Both the sulphate and tannate of pelletierine are used as tenicides, the former in doses of 5 to 6 grains, and the latter in doses of 15 to 20 grains. Usually some curariform symptoms are observed, motor paresis of the extremities, weakness of the legs, vertigo cramps persistent formication, nausea, and sometimes vomiting.

The sulphate of pelletierine is much more dangerous than the tannate, and it is recommended to administer tannin at the same time as the sulphate of pelletierine.

Diseases of the Ear.

Under the Charge of W. MILLIGAN, M.D.

McKee (H. B.) "Asepsis in otology and laryngology."—*The Laryngoscope*, May, 1898.

The author remarks upon the value of asepsis in otology and gives the following as hints.

(1) To sterilise cutting instruments place in 2½ per cent carbolic solution for 15—20 minutes; then dip for a few seconds in boiling water.

(2) To sterilise trays or dishes for instruments pour over them a few drops of alcohol and ignite. The asepsis is complete.

(3) To sterilise blunt instruments (forceps, spatulæ, etc.,) pass through a spirit lamp which should be on every instrument table.

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(4) To sterilise catheters, antrum cannulæ, etc., boil for a few moments in a porcelain-lined dish.

(5) To sterilise cotton pledgets for wiping out the ear, dip the cotton wound probe into a saturated alcoholic solution of boracic acid, ignite it and allow it to burn for a few seconds, extinguishing before the cotton is charred.

(6) Needles preserve in pure lysol.

DUNDAS GRANT. "A case of hysterical nerve deafness with spontaneous recovery."—*Journal of Laryngology and Otology*, June, 1898.

THE patient, a female aged 18, complained of deafness in both ears, nasal obstruction and pain in the throat. The deafness was of three years duration, and had been gradual. It had become much worse after the extraction of eight teeth under gas and ether. Upon examination the patient could only hear loud conversation. The watch was heard at 6 inches, Galton's whistle up to mark 3·8, bone conduction on both mastoids was diminished and Rinne's test gave a positive result in both ears. Pain over the mastoids was complained of. On testing the hearing for various tuning forks by air-conduction, she was found to have completely lost her hearing for "C_2" and for "C_1," while for the other forks extending from "C" up to "E^5," the amount of hearing power varied from 3 to 4 up to 15 per cent. A diagnosis of nerve deafness, probably "auto-suggestive," was made. Treatment was accordingly prescribed, but did not appear to have much effect. Ultimately a spontaneous recovery took place.

The tuning fork tests for middle tones C^1 answered to the type of nerve deafness and were sufficient to exclude middle-ear disease. The tests for air-conduction throughout the whole range of audition indicated that the maximum loss was for deep tones. In typical disease of the labyrinth the opposite would be the case.

EWING (A.) "Gauze packing for suppurating ears.—*The Laryngoscope*, June 1898.

IN this paper the author strongly protests against the practice of douching suppurating ears, upon the grounds that there is nothing more calculated to favour the growth of pathogenic organisms than moisture. In supporting his theory he emphasises the well-known fact that a traumatically ruptured drum membrane will seldom suppurate if kept dry, and also that in cases of chronic suppurative middle-ear disease which have become dry, the way to keep them dry is to avoid all moisture, etc. He recommends iodoform gauze, bichloride or borated gauze, as the best material for packing.

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WAGGETT (L.) and WILKIN (G. C.) "A case of epithelioma of the middle ear treated by injections of pyoktanin."—*Journal of Laryngology and Otology*, July, 1898.

EPITHELIOMATA of the middle ear are distinctly rare, only about twenty cases being on record. In Mr. Waggett's case the patient was a female, aged 50, who presented herself at the hospital complaining of a foul discharge from the left ear, accompanied by a marked degree of pain. The otorrhœa had troubled her since childhood, and had never been seriously treated. No facial paralysis was present. Upon examination a polypus was seen occupying the inner half of the meatus, bathed in fœtid pus. The polypus was removed with the snare, and the patient told to return in two days. She did not, however, appear again for seven weeks. The pain, which had been relieved after the removal of the growth, had returned with increasing severity. The discharge was copious, blood-stained and fœtid, and the meatus was again found occupied by a large polypus of purple colour, slightly mammillated, very friable, but not very vascular. The growth was removed with the snare, and upon microscopic examination proved to be of typical epitheliomatous structure. No operation was performed on account of the disappearance of the patient, who died six months afterwards, with extensive infiltration of the parotid region.

In Mr. Wilkin's case the patient was a female, aged 61, who, after an accident, suffered from great pain in the left ear and frequent attacks of spontaneous hæmorrhage from the ear. Upon examination a large swelling was found in front of the left ear, reaching down to the angle of the jaw, forwards to the anterior border of the masseter muscle, and upwards to the level of the zygoma. There was facial paralysis upon the left side. No enlarged glands were to be felt. There was a foul watery discharge from the meatus, which was occupied by vascular granulations. Microscopic examination proved the growth to be a squamous-celled epithelioma. As operative interference was contra-indicated, both from general and from local reasons, injections of pyoktanin were commenced, the strength of the solution being gradually increased from 1—500 to 1—100. Relief from pain was certainly afforded, but the growth made steady progress and the patient died.

WHITING (F.). "Pyæmic sinus thrombosis." — *Archiv f. Otolog.*, February, 1898.

IN an elaborate article upon the symptomatology and treatment of pyæmic sinus thrombosis the author reviews and criticises much of the work which has already been done upon this subject, and especially the work of Hessler and Körner.

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Summary.—The indications for jugular ligation in sigmoid sinus thrombosis are as follows :—

(1) The indications which justify an operator in tying the jugular before exposing the sinus should be very decided, and as follows : (*a*) the existence of chronic otorrhœa ; (*b*) pronounced manifestations of pyo-septicæmia, high fever, sudden remissions, and repeated rigors ; (*c*) metastases ; (*d*) Griesinger's symptom—occipital œdema ; (*e*) œdema of eyelids of corresponding side ; (*f*) tenderness along the course of the jugular in the neck, and perhaps the cord-like feeling of the infected vein ; (*g*) commencing neuro-retinitis. A majority of these symptoms should be present.

(2) The indications for ligature after exposing the sinus and recognising the thrombosis, but before opening it : (*a*) the presence of a clot extending well down into the bulb and disintegrated in its lower portion (so indicated by aspirator), associated with distinct pyæmic symptoms, although metastases are absent ; (*b*) the display by the sinus of respiratory movements would render probable the admission of aerial embolism to the heart unless the vein were first tied.

(3) Indications for ligation after exposing and opening the sinus : (*a*) the presence of a large thrombus extending down into the bulb, and having undergone purulent liquefaction in the deep bulbous portion, which may not have been diagnosed until the sinus was extensively opened, the curetting deeply in the neck under such conditions is fraught with imminent risk to the patient unless the vein is tied ; (*b*) inability to re-establish the circulation from below, whether the clot has or has not disintegrated, and whether or not there has been tenderness in the neck ; (*c*) inability to re-establish the circulation from either direction has aroused some discussion as to the advisability of ligating both jugulars."

Diseases of the Throat and Nose.

UNDER THE CHARGE OF A. HODGKINSON, M.B., B.Sc.

SAINT-HILAIRE. "Two cases of empyema of the maxillary sinus, following plugging of the nasal fossæ."—*Archives de Laryngologie*, March-April, 1898.

SAINT-HILAIRE draws attention to a danger of plugging the nasal fossæ, inasmuch as such procedure has been followed by maxillary

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empyema in at least two cases in his experience. In both instances the nostrils had been plugged for severe epistaxis—in one patient due to cerebral congestion. Within a few days after the removal of the plugs unilateral purulent nasal discharge and pain in the head and face developed in each case. One was operated upon, and the other refused operation.

The author is of opinion that, since the source of troublesome hæmorrhage is usually in the anterior part of the septum, it is not necessary to entirely plug the nasal cavities. The application of a small piece of cotton wool, impregnated with some hæmostatic, or the application of the galvano-cautery to the bleeding point, will usually stop the hæmorrhage, and at the same time avoid the danger and inconvenience of plugging. Saint-Hilaire's explanation of these productions of maxillary empyemas is that the nasal cavity, being occluded before and behind, becomes filled with blood, some of which is forced into the antrum, where it decomposes, and leads to suppuration in the cavity.

MOLL. "Anterior epiglottic angina."—*Archives de Laryngologie*, May-June, 1898.

MOLL quotes the case of a man who had previously enjoyed good health, but who was suddenly seized in the night with a violent pain in the throat, accompanied with great difficulty in swallowing. The epiglottis—the only portion of the larynx visible—was red, swollen, and more or less fixed. Ice, ichthyol (locally), and a laxative were prescribed. Two small abscesses formed, which were duly opened. The applications of ichthyol were continued, and by the eighth day the œdema, hyperæmia, and infiltration had disappeared. The author believed the patient to be suffering from an acute infectious inflammation of the epiglottis of influenzal origin.

PATERSON. "The supratonsillar fossa and its affections."—*Journal of Laryngology*, April, 1898.

THE author expresses surprise that, in face of the amount of attention directed to the fauces and tonsils of recent years, the existence of an anatomical space of no little importance in relation to both structures should have been overlooked almost entirely.

If the anterior palatal arch be carefully observed, there may be seen a fold of mucous membrane arising from its free border and stretching backwards towards the tonsil, which it partially covers. This fold has been given the name *plica triangularis*. At the upper part of the

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tonsillar region, and immediately behind the plica, there exists a cavity which extends into the soft palate for a variable distance, and has been termed by His the *supratonsillar fossa.* The situation and relation of this fossa are influenced by the disposition of the plica and the development of the lymphoid tissue, and are therefore variable. The extent of the cavity is by no means constant, and in certain cases it may extend outwards, behind the palato-glossus muscle, almost to the lower jaw. It may also take other directions. The author has never failed to find the space in children and young adults; but in middle life and old age there may be little or no trace of it.

Turning to the morbid processes which may make the supratonsillar fossa the base of their operations, the author has found that the more common are suppurative disease, papilloma of the plica triangularis, malignant disease, and foreign bodies. In suppuration the pus may be thin, or of thicker consistence and discharge more or less constantly. On the other hand, the pus may be pent up for certain periods, giving rise to discomfort, sometimes amounting to pain, which is relieved on the establishment of discharge.

The author's treatment was to make a free opening for the exit of purulent, cheesy, and occasionally gritty material; to evacuate the cavity by pressure on the anterior faucial pillar, and to apply antiseptics to the interior of the fossa.

The author quotes cases exemplifying the other diseases commonly found in this region.

Lack. "A case of clonic spasm of the pharynx."—*Laryngoscope*, April, 1898.

This case, which was shown at the Laryngological Society of London (January, 1898), came under the author's care, complaining of "phlegm in the throat." On examining the pharynx a twitching movement of the posterior pharyngeal wall was at once noticed, the parts being drawn sharply to the left, and then relaxed. The movement resembled nystagmus. The palate moved slightly in association, but there was no twitching of the laryngeal muscles. Except for some chronic rhinitis the patient was in good health. The case was brought forward in order to gain some information as to the etiology or pathological associations of this rare affection.

Eugene S. Yonge.

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Pathology and Bacteriology.

UNDER THE CHARGE OF A. SHERIDAN DELÉPINE, M.B., B.Sc.

SANARELLI (G.). "Étiologie et pathogénie de la fièvre jaune."—*Annales de l'Institut Pasteur*, June, Sept., Oct., 1897.

ALTHOUGH the specific nature of yellow fever has been known for a long time, our information as to its etiology and pathology has, in spite of much research, been most imperfect. This is due principally to the proteiform and complicated character of its symptoms, and to the failure to discover the specific cause.

The disease presents a group of most varied symptoms, which can usually be divided into three periods.

The onset, which is generally sudden, occurs after an incubation period of two to four days. The patient, generally during sleep, is seized with more or less intense shivering, and elevation of temperature to 40° or 41° C. Sometimes the symptoms have nothing characteristic about them, but are the usual signs of the onset of an infectious disease—severe headache, intra-orbital, epigastric and muscular pains, general lassitude, nausea and vomiting, and, above all, intense pain in the back.

The general aspect of the patient soon becomes very grave. The skin is sometimes dry, sometimes bathed in perspiration, the face red, eyes suffused, pupils dilated, and the look excited.

Insomnia and an unaccountable anxious excitement, together with spasmodic rachialgia and epigastric oppression, throw the patient into extreme mental and physical prostration. Obstinate gastric intolerance, nausea, and severe thirst prelude vomiting, at first mucous and then bilious. The bowels are, as a rule, constipated, the urine scanty and slightly albuminous. These symptoms increase during the first two or three days, during which period jaundice generally appears.

Towards the fifth day a remarkable change occurs—the fever abates and the pains cease. The patient feels well, and looks forward to a speedy recovery. The epigastric discomfort and vomiting do not, however, entirely cease, and this period, which may last from a few hours to two days, either ends in convalescence or in a rapid aggravation of all the symptoms constituting the final stage.

The temperature rises, the gastric discomfort and vomiting increase, the jaundice becomes more intense, the pulse is thread-like, and the skin is bathed in fœtid sweat; profound depression, passing to unconsciousness; hæmorrhage from the nose, ears, eyes, genital organs, and intestines;

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anuria and intense lumbar pain supervene; vomiting of blood exhausts the sufferer, who soon becomes delirious and collapsed; the temperature falls, and the pulse is feeble; hiccough and almost continuous vomiting supervene; and the patient dies on the fifth to the seventh day of the illness, comatose or in convulsions.

Remarkable variations from this type are the early or late appearance of jaundice; the early or late appearance of vomiting, which may never become hæmorrhagic; in fatal cases the time of death, which may occur in forty-eight hours, or may be postponed to the tenth or twelfth day; and the impossibility of fixing a specific pyrexial chart for this disease. The most important complications are dysentery, parotitis, abscesses, and furuncular erruptions, which generally appear in the last period or at the regaining of convalescence.

Relapses are always severe, and may occur long after convalescence has commenced. Secondary attacks are rare and are most frequent after a mild attack. The post-mortem lesions show nothing pathognomonic of yellow fever. The same tendency to fatty degeneration and hæmatolysis, so pronounced in this disease, is found in many other affections, such as poisoning by arsenic, phosphorus, and alcohol, typhoid fever, etc. The same alterations of gastro-intestinal mucous membrane, the gastric erosions, and the hyperæmia of the meninges and of certain glandular organs are not peculiar to this disease, but are found, as primary or secondary lesions in many other morbid states, nevertheless the changes produced by yellow fever give us a better defined anatomical criterion than is found in the majority of other infectious diseases. For the purpose of studying this disease, Dr. Sanarelli established a small laboratory at the island of Flores, and here, and subsequently at Rio Janeiro, he was able to examine a considerable number of cases. In the second case he was fortunate enough to discover a bacillus which subsequent research showed was the specific organism of the disease. In this case cultures made from the blood both before and after death, from the spleen, liver, lungs, urine, and bile, and, associated with the coli bacillus, from the kidneys and secretions of the trachea and bronchi, revealed this specific bacillus, which was named the bacillus icteroides. This organism was not found in any culture made from the gastro-intestinal tract.

In some cases which were clinically and anatomically yellow fever, no trace of the bacillus icteroides was found, the blood and tissues being loaded with a streptococcus or a coli bacillus; in others, this organism was obtained during life in pure cultures both from the blood and from the hepatic juice, but after death it was obtained only in association with other organisms. In yet others, whilst the blood and hepatic juice were sterile during life, a great variety of organisms was obtained after death.

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The bacillus icteroides is easily cultivated on the usual media, both liquid and solid, and is an organism with rounded extremities, often united in pairs, 2μ to 4μ in length, and, as a rule, twice as long as it is broad, and possesses four to eight cilia. It is easily stained by the usual methods, and does not resist Gram's stain. It is a facultative anaerobe, slowly ferments lactose, more actively ferments glucose and saccharose, but does not coagulate milk.

Cultivated on gelatine plates, at 20° C., it often presents towards the eighth day a very characteristic appearance, but atypical forms are often met with even in recently isolated cases, and, contrary to what we observe in cholera, typhoid, and other infectious diseases, the gelatine plate culture is not the best method for the bacteriological diagnosis of this organism, but the growth on agar is of the first importance. If a drop of blood, hepatic or splenic juice from a case of yellow fever, in which there has not been much secondary infection, is sown upon a tube of agar, and incubated at 37° C., the colonies present nothing remarkable, but if, after remaining at this temperature for 12—24 hours, they are removed to a temperature of 20—28°, one can observe a projecting opaque white growth which becomes more prominent and ultimately surrounds the flat transparent colony developed at the higher temperature. This appearance, which can be well compared to the impression of a seal, is so characteristic and well defined that it serves to distinguish the bacillus icteroides from any other micro-organism with which we are acquainted.

By diluting the material to be examined with bouillon, and making successive strokes on a series of agar tubes, the characteristic colonies may be obtained in twenty-four hours, and the diagnosis established without using the microscope.

The microbe is at once destroyed by moist heat at 65° C., and in a few moments at 60° C., whilst with dry heat it will resist a temperature of 100° for over an hour, and is destroyed at 120—125° C.

When threads soaked in a bouillon culture are dried at 37° C. for 24 hours, and then exposed to a variable external temperature, the organisms retain their vitality even after a very considerable time, thus leading to the conclusion that spontaneous dessication at the ordinary temperature leaves a great degree of vitality. Cultures exposed to direct sunlight are more or less rapidly sterilised. The organism is capable of living for a long period in sterilised sea water.

In the tissues the bacilli tend to form little groups in the small capillaries of the liver, kidney, etc., and are best demonstrated by hanging portions of the liver in a moist chamber at 37° C. before examining.

Their multiplication seems to take place to a very small extent in the human body, but their toxins are capable in very small quantity of

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producing the grave symptoms that occur in this disease, and these toxins, either directly or indirectly, by their effect on the liver and gastro-intestinal mucous membrane, facilitate to an extraordinary degree the production of secondary infections which often take the type of coli, streptococcus, or staplylococcus septicæmias, and this tendency to secondary invasions can be observed experimentally both in animals and in man. As the bacillus is found in the blood and tissues, and never in the gastro-intestinal contents, it is evident that the gastro-intestinal symptoms and lesions, which formed so prominent a feature of this disease, are due to an absorption of the toxin, which is elaborated elsewhere.

The secondary infections alluded to above are almost always due to well-known micro-organisms, such as as coli bacillus, streptococcus, staphylococcus, and proteus, which can invade the organised body long before death, and the fatal termination of the illness and its proteiform character is often rather due to the nature and character of these secondary infections than to the specific organism itself. Both in man and in the lower animals yellow fever represents a disease with a cyclical course, during which course the specific organism is found in very small quantities, and it is only at the end of the cycle that it multiplies rapidly and, accompanied by other microbes, derived probably from the intestinal tract, invades almost suddenly the entire organism. It is only in cases that regularly complete this cycle that one can with relative facility meet with the specific organism, it being extremely difficult to isolate it when an intercurrent septicæmia or an early uræmia arrests the cycle by killing the patient.

Once introduced into the organism, the bacillus icteroides produces a general intoxication and specific alterations, especially in the kidneys, digestive tract, and liver. In the kidneys an acute parenchymatous nephritis is one of the earliest effects, and to this one can attribute the anuria which declares itself at an early stage; whilst in the digestive tract it produces hæmatogenous gastro-enteritis, and in the liver a rapid fatty degeneration.

The sufferer is, in fact, threatened by three imminent dangers, and the bacteriological examination can approximately determine the principal cause of death. In those cases which run to the end of the disease cycle, and in which the bacillus is found in fair quantity and in a relative state of purity, the patient has probably succumbed to the specific infection.

When the body presents an almost pure culture of other microbes, it may be assumed that death is due to septicæmia produced in the course of the disease; whilst, when cultures made from the body are almost sterile, the percentage of urea being increased and death occur-

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ring before the end of the evolutionary cycle, the fatal issue is probably, in best part, due to renal insufficiency.

As the most striking symptoms of yellow fever intoxication are easily confounded with those of uræmia, it is difficult to determine during life which symptoms predominate; and the uræmic intoxication may account for the absence of a typical pyrexial chart and the frequent occurrence of a normal or sub-normal temperature, as well as for the occasional sudden and inexplicable termination.

The vomiting is due to the specific emetic action of the toxins, the "black vomit" being caused by the action of the gastric juice on the blood extravasated in the stomach.

The hæmorrhagic character of the disease is due to the "hæmorrhagiparous" property possessed by this bacillus in common with other organisms, and also to the extraordinary and rapid fatty degeneration produced in the vessel walls.

The bacillus icteroides is pathogenic for the majority of domestic animals. In white mice, guinea-pigs, and rabbits it produces a disease analogous to what we observe in men, lasting in white mice and rabbits about five days, and in guinea-pigs six to eight days.

During the course of the disease the organisms inoculated multiply to a very small extent, and it is only 24 to 48 hours before death that they suddenly invade the blood.

In guinea-pigs and rabbits the disease can be experimentally conveyed by the respiratory tract, which would suggest that, in accordance with the presiding opinion, it may naturally be transmitted by the air. In the dog inoculation produces a train of clinical symptoms and anatomical lesions almost identical with those produced in man—vomiting, hæmatemesis, hæmaturia, albuminuria, hæmatogenous gastro-enteritis, nephritis, jaundice, profound fatty degeneration of the liver, and uræmia. In the majority of cases the bacillus is found in a state of purity, but sometimes associated with coli bacillus or streptococcus, and the study of the disease in dogs confirms the view expressed above that the "amarilligenous* poison," either by itself or by the alterations that it causes in the various organs, especially the liver, favours secondary infections.

In the monkey it produces complete steatosis of the liver or mixed infection.

In the goat and sheep the kidneys are markedly attacked, producing albuminuria, uræmic intoxication, and fatty degeneration of the liver, favouring secondary infections.

The steatogenous, hæmorrhagiparous, and emetic properties of the

* One of the names given to yellow fever by Spanish physicians is *calentura amarilla*.—S. D.

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virus thus form a group of symptoms which gives the disease its special character.

By inoculation of the toxic products of the bacillus icteroides (obtained by filtering a 15 to 20 days' growth in bouillon through a Chamberland candle) the same symptoms and lesions are obtained as after inoculation of the living organism.

In the dog, 5 to 10 cc. injected subcutaneously produces enormous local tumefactions, with slow absorption, but no characteristic symptoms. Injection into the veins, however, produces all the symptoms characteristic of this disease, and from the blood and organs, especially if the animal has lived several days, can be obtained abundant cultures of the streptococcus, more rarely of the coli bacillus and the streptococcus pyogenes aureus.

The invasion of these microbes and the formation of the specific toxic substances cause the total or partial disappearance of the bacillus icteroides by weakening its vegetative power or killing it directly. Experiments *in vitro* show that there are two forms of antagonism existing between the different species of microbes—a vital antagonism, which is manifest when a species cannot live and thrive in a medium in which another lives and thrives, and a chemical antagonism, which is manifest when a species cannot live and thrive in a medium in which another has lived and thrived. Experiments made on media containing the products of metabolism of the staphylococcus aureus, coli bacillus and proteus show that the baccillus icteroides is incapable of growth, and by cultivating the bacillus icteroides and one of the above organisms, either in the same nutritive medium or by inoculating them crosswise on a solid plate of agar, it is manifest that a marked antagonism exists between them, greatly to the disadvantage of the bacillus icteroides.

These researches fully account for the failure to discover the specific organism in a large number of cases.

The constancy of secondary invasions may be accounted for by the profound degenerative processes in the liver—the principal organ of defence against microbic invasion—and this view would be supported by the fact that in rabbits and guinea-pigs where the secondary invasions do not occur the hepatic lesions are slight.

The maritime propagation of yellow fever is a well-established fact, and the virus, if once established on board a ship, maintains itself for a long time, especially in the hold, magazines, merchandise, and all other close, small places. Old, worn-out, and insufficiently-ventilated ships are types of yellow fever vessels; but humidity, heat, darkness, and want of air have no specific action on this microbe, but are conditions directly favourable for the development of moulds, and hence indirectly for the bacillus icteroides, for moulds are capable of favouring the

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revival and multiplication of this organism in the most remarkable manner.

This phenomenon of communalism can be demonstrated with ease in the laboratory, gelatine plates inoculated with the bacillus icteroides often remaining sterile until a mould has been introduced, when, as soon as the mould has developed its mycelium, a crown of small punctiform colonies of the bacillus immediately appear, and, as the mould increases, the zone which they occupy extends rapidly.

This strange symbiosis reveals the moulds as the natural protection of the specific agent of yellow fever; through the intervention of this factor, so significant in appearance, the remarkable resistance of the bacillus to dessication, and its great longevity in sea water, is sufficiently explained the easy acclimatisation of yellow fever and its obstinate persistence in the infected localities.

We cannot now consider, as we have done heretofore, the digestive organs as the gate of entrance and the central seat of the specific bacillus. Evidence is strongly in favour of atmospheric transmission, and the lighter disorders of the digestive functions common in tropical countries predispose the individual to the contraction of this terrible disease and to the secondary infections which contribute to augment the appalling mortality. Serum from a fatal case rapidly produces clumping in a pure culture, and this phenomenon is also produced by anti-diphtheritic and anti-typhoid serum, but not by normal human serum or that of many other animals, and is slowly produced by the serum from a convalescent case.

When the serum from a convalescent case is injected into guinea-pigs simultaneously with the virus, death is not prevented, but in the majority of cases it does not take place if the serum is injected 24 hours before the virus.

As a patient who has suffered from yellow fever is left for a time well vaccinated against a subsequent attack, it is natural to conclude that a similar state might be produced in animals. Rabbits, goats, and sheep had to be relinquished on account of their excessive sensibility to the living virus, and the immunising experiments were carried out on guinea-pigs, dogs, and horses.

In the guinea-pig, however slowly the vaccination is conducted, the mortality is very high, and it is only after six or seven months that the animal becomes well protected. The dog can be more rapidly immunised, but it never becomes altogether accustomed to large doses of the toxin, especially when a bouillon culture is used.

Amongst the larger animals the ox has an advantage over the horse in tolerating subcutaneous injections of the icteroid culture without presenting the large swellings and prolonged febrile reactions, followed by

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ulceration of the part, which is the rule in the horse. On the other hand, besides the greater technical difficulty, the ox has the disadvantage of not tolerating without great inconvenience the intra-venous injection of toxin or sterilised virus.

The vaccination of the horse is carried out by injecting 5 to 10 cc. of the filtered culture subcutaneously, followed by injections into the external jugular vein. After about two months of such treatment, a culture sterilised with ether may be substituted, and it is not until five or six months after the commencement of the treatment that the living culture can be used. Each injection is followed by grave disturbance which often endangers life, so that the immunisation of animals against yellow fever is not only difficult but very tedious.

The serums so far obtained conferred immunity on guinea-pigs against a lethal dose of virulent culture, if given 24 hours before in doses of 0·5 cc., and in doses of 2 cc., inoculated 48 hours after, saved the lives of guinea-pigs already ill; but it is probable that these doses are far from representing the preventive and curative powers of the anti-amarilligenous serum. *E. J. Sidebotham.*

CHAILLÉ (S. E.). "Prevention of yellow fever, and the quarantining of houses to stamp it out."—*New Orleans Medical and Surgical Journal*, May, 1898.

YELLOW fever is, like cholera and typhoid fever, an indirectly contagious disease, rarely, if ever, directly contagious, and is, like them, due to a specific germ, which is capable of growing not only in the animal body but also outside it.

It is essentially a filth disease, and the most important measure to prevent the growth of the contagium outside the human body is cleanliness, in the broadest sense of the word.

The quarantine measures which are successfully applied to prevent the spread of the disease by ships, viz., isolation of the ship, complete disinfection, isolation of the sick in hospital, and detention of those who are well until the period of incubation has passed, are not easy to apply on land. The close approximation and intercommunication of houses in towns, the impossibility in many cases of disinfecting the space and soil beneath the ground floor, and the fact that the health officer has to depend for diagnosis and notification on a number of practitioners, puts the municipal officer at a great disadvantage as compared with the quarantine officer.

The strict quarantining of houses is apt to produce such opposition that early diagnosis and prompt notification is discouraged, sickness is concealed, the sick are deprived of medical care and needful attendance,

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and the inmates often bribe or deceive their guards, so that surreptitious visits are paid, and the inmates escape from the house.

Reliance must be placed on absolute cleanliness, especially during an epidemic; thorough disinfection of all the discharges from the sick; disinfection of all clothing and bedding, and of everything and everybody leaving the sick room; and dissemination among the people of sanitary knowledge—above all, knowledge of the infective nature of this disease, the necessity for serious restrictions on the sick room, and for some restrictions on those who are well. These restrictions should be as light as is consistent with the public safety, any damage inflicted on individuals being paid for out of the public purse.

Every effort should be made to gain the co-operation of the profession and the public in securing early diagnosis and prompt notification. If, in spite of the preventative measures executed, the cases multiply and become more scattered, it is probably wiser to end all restrictive measures, and then to rely solely on persuasion and the vigorous prosecution of measures that do not necessitate offensive violation of personal rights, viz., cleanliness and disinfection.

ARCHINARD (P. E. and J. J.), and WOODSON (R. S.). "The serum diagnosis of yellow fever."—*New Orleans Medical and Surgical Journal*, February, 1898.

THE difficulty in the diagnosis of early, mild, and atypical cases of yellow fever indicates the importance of proving a specific serum reaction that can be relied upon as a pathognomonic sign of this affection.

The authors give an account of the application of Widal's method in a series of cases, and claim that the disease is as capable of accurate and certain diagnosis by this method as is typhoid fever, the characteristic reaction, agglutination, and cessation of motion being obtained in over 70 per cent of the cases.

The Johnston dried-blood method on glass slides was followed, the blood being dissolved in sterile water.

The cultures used were bouillon cultures, 18 hours old, but experience showed that cultures 36 hours old were preferable.

The proportion in the first 20 cases was 1 of blood to 5 of culture, but this was found to produce agglutination of the bacillus typhosus as well as of the bacillus icteroides, and a dilution of 1 to 40, with a time limit of 1 hour, was preferred for accuracy of diagnosis.

With this dilution two yellow fever cases, with a pre-existing history of typhoid, gave the reaction with cultures of both bacilli, and a similar result was obtained in four cases in which typhoid fever was suspected and there was a previous history of yellow fever. These cases prove the

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existence of two specific "agglutinins" in the blood at the same time. The serum diagnosis of yellow fever may be utilised as early as the second day, and be exceptionally present as late as 19 years after the disease.

Dried specimens of blood retained, in some cases, their agglutinative property for more than three months. *E. J. Sidebotham.*

Reviews.

"Ringworm in the Light of Recent Research." By MALCOLM MORRIS. London: Cassell and Co. 1898.

MR. MALCOLM MORRIS has produced a book on ringworm which almost deserves the title of an *édition de luxe*, the clear printing, wide margins, and beautifully reproduced illustrations add a pleasure to its perusal which is too often wanting in medical literature. It must not, however, be supposed that anything of a scientific or practical character has been sacrificed to appearance, for the author enters thoroughly into the question of ringworm in its diverse forms, and gives a fair account of the views held by eminent authorities, and of the results obtained in recent years by means of experimental researches upon the fungi causing ringworm.

After a short introduction upon nomenclature, the first six chapters are devoted to the consideration of the etiology and pathology of ringworm; the work of Gruby, Thin, Sabouraud, Bodin, Fox and Blaxall, Leslie Roberts, and other authors, is reviewed and compared. Mr. Malcolm Morris then gives the results of his own numerous observations and experiments and briefly summarises our present position regarding the cause of ringworm; he believes that "there are at least two, probably three, possibly more, distinct species of fungi which produce the disease in different cases," but he is not able to accept Sabouraud's views in their entirety.

The next four chapters are devoted to a description of the clinical varieties of ringworm, their diagnosis and prognosis. The last two chapters deal with treatment and prophylaxis. The subject of treatment is very fully considered, various plans are given in detail, and their advantages and disadvantages set forth. For ordinary cases the author prefers chrysarobin, applied until slight irritation is produced, and followed by an ointment of boric acid, or the oleate of zinc or copper; should this prove unsuccessful, recourse is to be had to sulphur, mercury, or iodine.

With regard to formalin, he does not consider that it is superior to other applications, and rightly calls attention to the very severe

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pain caused by its use. The question of the relation of ringworm and alopecia areata deserves a fuller consideration than the author awards it. He states that "Bald ringworm can be distinguished from alopecia areata only by the fact of its having begun in scaly patches and by the presence of the fungus in some broken hairs at the edge of the patch," and admits that "sometimes the affections are practically indistinguishable." He does not, however, state whether he agrees or not with those authors who regard the common form of alopecia areata and the bald form of ringworm as the same disease.

The plates are twelve in number; eleven are beautiful reproductions from microphotographs, the other is a coloured plate showing the different ringworm fungi stained by the author's method.

All practitioners who are interested in the subject of ringworm, and wish to be informed of the present position of our knowledge, can be cordially recommended to purchase and read Mr. Malcolm Morris's monograph.

As we have already intimated, the general get-up of the book is admirable.

"Notes on Pharmacy and Dispensing for Nurses." By C. J. S. Thompson. London: The Scientific Press. 1898.

A small book to teach that elementary knowledge of drugs and dispensing which nurses require has long been wanted, and, in spite of the present attempt, the want still remains unsupplied. Much of the information contained in this little book is of value, and the directions are in many cases clear and concise, but an effort is made to include too much, and not sufficient allowance is made for the slender stock of chemical knowledge possessed by the average nurse.

The first section treats of the nature of groups of preparations, and terms such as "distillation" and "maceration" are employed without any attempt at explanation.

The next four sections consist of lists of drugs, classed, according to their therapeutic action, as "alteratives," "anæsthetics," "anodynes," etc. The whole of this portion has no place in a work on pharmacy and dispensing; the lists are catalogues of names which include, without discrimination, well-known drugs in ordinary use and the latest products of the laboratory.

The remaining sections deal with the practical work of dispensing, the implements and apparatus employed, and the methods of making up mixtures, draughts, emulsions, pills, powders, gargles, lotions, liniments, etc.; considerable space is devoted to the dispensing of incompatibles, and sensible directions are given for ordinary cases.

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It is questionable whether the inclusion of methods for coating pills, filling capsules and cachets, and preparing compressed tablets are of any use in a work of this scope. A list of Latin terms is appended, but would have been much more useful if the ordinary abbreviations in use had also been given, and if it had included such ordinary directions as "three times a day" and "every four hours," as well as some statement regarding the relation between ounces and drachms and the ordinary domestic measures.

A useful account is given of the examinations of the Pharmaceutical Society and the training required.

A careful pruning of the more advanced sections, and an amplification of the elementary portions, with some examples of actual prescriptions, would produce a very useful work for the purpose indicated. An opportunity will be afforded for this revision by the appearance of the new "Pharmacopœia," as the one upon which the "Notes" are based is already obsolete.

The paper and printing is good, and the type large and clear.

"The Extra Pharmacopœia." By William Martindale, F.L.S., F.C.S., and W. Wynn Westcott, M.B. Ninth Edition. London: H. K. Lewis. 1898.

The ninth edition of Martindale and Westcott's "Extra Pharmacopœia" follows closely the appearance of the new "British Pharmacopœia," and, as it is revised in accordance with the official publication, will be very welcome to many practitioners who are somewhat at a loss to remember the various changes which have been made in official formulæ.

A synopsis of these changes is given throughout the book, the official and non-official preparations are carefully discriminated, and the newly-introduced preparations commented on.

Some new drugs are described, among which are the eucaines, holocaine, orthoform, chelidonium, additional glycerophosphates, fresh substitutes for iodoform, and new silver compounds. The sections dealing with antitoxins and organotherapy have been largely extended. Some slight omissions have been made, but nearly fifty additional pages have been required.

One innovation will undoubtedly attract attention, that is, the doses of all drugs are given in the metric, as well as in the imperial system of weights and measures.

There is little more to be said regarding so well-known and indispensable a book as the "Extra Pharmacopœia," beyond stating that the present edition is thoroughly up to date, and as reliable and useful as the former editions have proved to be.

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We must congratulate the authors upon the promptitude with which they have been able to bring out the ninth edition, and especially upon the absence of any signs of haste or want of care in its preparation.

"Diabetes Mellitus and its Treatment." By R. T. WILLIAMSON, M.D. (Lond.), M.R.C.P. Edinburgh and London: Young J. Pentland. 1898.

DR. WILLIAMSON, a former editor of the MEDICAL CHRONICLE, whose numerous original and valuable observations on diabetes must be well known to the readers of that journal, has in this volume, which covers over 400 pages, given us a complete and exhaustive treatise, which will occupy a foremost rank amongst the special treatises, and which will be most useful to the general practitioner and not less welcome as a book of reference. The book is the outcome of many years' practical study and accurate observation. Dr. Williamson has made excellent use of his position as Registrar to the Manchester Infirmary, and of the large material which he had at his disposal, and we find in every chapter of the book original observations, sound criticism, and statistical records of great value. The book is the most complete and exhaustive treatise on diabetes in the English language. After a brief introductory, Dr. Williamson gives an exhaustive account of the tests for sugar and their respective values. Fehling's test he prefers in most cases, but to avoid fallacies he recommends in cases in which only a trace of sugar is present, or in which the reaction is doubtful, the additional tests by fermentation and by phenylhydrazin, and gives a simple way for applying these tests. Physiological considertaons about diabetes, expermental diabetes, glycosuria, phlorizin diabetes, and experimental pancreatic diabetes form the subjects of the next chapters, and are treated in a clear and concise manner, none of the important observations being missed, whilst in another chapter glycosuria from various other causes is discussed.

The Etiology of Diabetes occupies more than 60 pages, and the author enriches this chapter by statistics from cases observed in the Manchester Royal Infirmary, and the etiological relations of diabetes mellitus to diabetes insipidus, to diseases of the liver, to affections of the nervous system, to lesions of the pancreas, and to arterio-sclerosis, are fully discussed; and here again the author has largely drawn upon the clinical and the pathological material at his command. The symptomatology, as might have been expected, forms a prominent part of the book, occupying more than 100 pages. It is impossible to refer at length in a short review to the original observations with which Dr. Williamson's name has been associated, *e.g.*, the colour test

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for diabetic blood, and the changes in the spinal cord—observations which have been confirmed by other investigators. The symptoms relating to various organs and systems of organs are given in a clear and exhaustive form, and more particularly those of the skin, kidneys, and nervous system. The author does not enter into minute descriptions of cases, but enumerates the principal symptoms, and does not forget to sketch the pathological anatomy and the lessons which underlie the symptoms. Diabetic coma forms a chapter by itself, and its etiology, symptomatology, and all that is known about its pathology and treatment is given. We believe with the author that the sudden alteration of the ordinary diet to a strict diet, with the avoidance of all hydrocarbonaceous food, may lead to the occurrence of diabetic coma, an opinion which is held by many Continental observers, and especially by the most recent writer — Naunyn, whose work appeared after Dr. Williamson's book was published. Dr. Williamson speaks well of the treatment of diabetic coma by large doses of citrate of potash. Naunyn recommends large doses (30 grammes per day) of bicarbonate of soda, which he gives in cases of diabetes whenever the urine gives the reaction for aceto-acetic acid, with perchloride of iron, and states that ever since adopting this plan of treatment no case of diabetes under his care has died from diabetic coma.

After a brief consideration of the pathology, diagnosis and prognosis of diabetes, the author discusses at full length the dietetic and medicinal treatment, which is perhaps one of the best chapters in this excellent treatise, and which will be found of great use to the general practitioner. The most recent observations of English and Continental observers are duly chronicled and criticised, and the author gives a detailed account of the preparation of some of the substitutes for bread, with modifications suggested by himself.

In conclusion, we may say that the book is got up in a masterly way; the style is clear and concise, and the reader is not wearied by minute details. Eighteen excellent illustrations, of which two are coloured, accompany the text. We heartily congratulate Dr. Williamson on giving us a treatise on diabetes, which is so complete, and a store-house of useful knowledge on all matters relating to diabetes, and which shows throughout assiduous, painstaking, and accurate work of many years.

"Researches on Tuberculosis." By Arthur Ransome, M.D., F.R.S. London: Smith, Elder, and Co. 1898.

The subject propounded by the adjudicators of the Weber-Parkes Prize, which was awarded for the first time in October, 1897, was "The means, prophylactic or curative, deemed by the author to have value in

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the control of tuberculosis, especial regard being had to their application to human tuberculosis."

The essay, now published, was successful in gaining the prize; and it contains the latest views of a universally-recognised authority on the subject.

Dr. Ransome shows, in the first place, that the prevalence of tuberculosis in crowded cities and unventilated dwellings proves that insanitary conditions are favourable to the existence of the specific bacillus and increase its virulence; and he then goes on to detail experiments, which prove that fresh air, sunlight, and dryness of soil are inimical to it. As predisposing causes of tuberculosis in the individual, the author recognises hereditary weakness, susceptibility of constitution, various diseases, such as enteric fever, and unhealthy occupations. He is a strong believer in the frequency of reinfection, and gives cogent reasons for his belief. It is noteworthy that, in opposition to several well-known writers, he sees no reason to think that pleuritic effusion is almost always due to tubercle.

Dr. Ransome is in agreement with other authorities in believing that infection takes place most frequently by inhaling tuberculous dust into the respiratory passages, and, in the next place, by the ingestion of tuberculous food.

Among preventive measures, he looks upon notification as valuable in that it gives the medical officer of health the information which he requires for the thorough investigation of the disease; but he is not an advocate for compulsory notification.

Disinfection of the rooms inhabited by the patient is necessary, and the agent recommended is a 1 per cent solution of chlorinated lime, which has also been found to efficiently disinfect tuberculous sputum when euchlorine and sulphurous acid have failed.

A large increase in the number of hospitals for tubercular cases is held to be a desideratum, and greater activity in carrying out sanitary measures is required.

The author has nothing but praise for the open-air treatment, which is now extensively used on the Continent, and is on its trial, on a limited scale, in this country, at Bournemouth and Cromer.

He shortly narrates three cases which appear to have been favourably influenced by inhalations of pure ozonised oxygen under slight pressure. These cases were described in full in the MEDICAL CHRONICLE for 1888 and 1889.

In conclusion, Dr. Ransome gives a list of drugs which he has tried in the treatment of tuberculosis. In most cases they proved unsatisfactory; but his experience of iodoform is favourable, and agrees with that of other physicians who have tried it. Creosote has also been found beneficial in doses of 5 and 10 minims.

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Throughout this valuable monograph the author is careful to mention the names of the colleagues who have been associated with him in the carrying out of the various experiments.

"The Medical Examination for Life Assurance." By F. DE HAVILLAND HALL, M.D., F.R.C.P. London: John Wright and Co. 1898.

THIS is a small book of 69 pages, founded on an article contributed by the author to the "Medical Annual," in 1896.

As may be expected from its size, Dr. Hall has not attempted to write an exhaustive treatise, but, as far as it goes, the work will prove a trustworthy guide to men who have not had much experience in examinations for life assurance. We have gone through the book with the object of discovering the advice given in regard to points on which differences of opinion may reasonably exist.

We notice that the author sanctions acceptance at ordinary rates of cases with a clear history of syphilis, followed by mild secondary symptoms, provided that they have been carefully treated, and that there has been an interval of two years since the appearance of any symptoms. As regards cases presenting organic murmurs of the heart, Dr. Hall, like most other physicians, would absolutely reject those with the murmur of aortic regurgitation. As regards other murmurs, he very wisely advises that less attention should be paid to their locality and character, and more to the condition of the heart muscle, the pulse, the effect of exertion, and so on, considered with relation to the environment of the proposer. When considering cases of so-called "cyclic" or "functional" albuminuria, the author comes to the conclusion that with our present limited knowledge, the examiner is not justified in recommending any applicant suffering from albuminuria at the time of examination.

We think that a few well-selected illustrative cases would have added to the usefulness of the book, and might well have occupied the space filled by a list of insurance offices, with their varying tariffs.

Such cases need not have entered on the minutiæ of extra rating, but might have been so arranged as to guide the referee in broadly classifying lives, as first-class, fair, or bad.

"A System of Medicine by Many Writers." Edited by T. CLIFFORD ALLBUTT, M.A., M.D., F.R.S., F.R.C.P., Regius Professor of Physic in the University of Cambridge. Vol. V. London: Macmillan and Co. 1898. Price 25s. nett.

ALL readers of medical literature will be pleased to hear of the publication of Vol. V. of Professor Allbutt's System. This volume is devoted

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to diseases of the respiratory and circulatory organs, and blood diseases, and like its predecessors, contains an excellent summary of the present state of medical knowledge respecting the subjects to which it is devoted.

The editor is to be congratulated on his good fortune in securing the assistance of so many eminent physicians and pathologists.

In the preface Professor Allbutt apologises for the delay in publication. The volume ought to have contained an article on thrombosis and embolism, by Professor Welch, of Baltimore. But before the completion of his task, we are told, Professor Welch "found himself committed to a desperate fight for the freedom of physiological research in the United States," and the duty fell upon him of organising the profession in opposition to a bill on this subject before the U.S. Congress. Unexpected delays have occurred, and even yet the fate of the bill is not sealed. This additional work has prevented Professor Welch from completing his article. The American Professor writes: "All this trouble comes from England, where, if your scientific men had made any sort of courageous stand twenty years ago I should not have been sacrificing my time and energies in this way. I am disposed to think that the trouble I have caused you is a judgment for the delinquencies of your countrymen in this matter." Professor Welch's article does not appear. It will be included in Vol. VI. We hope that British readers will feel sincerely penitent.

The first section of the volume is devoted to diseases of the respiratory organs. A very detailed account of bronchitis in its various forms is given by Dr. Ewart, who also contributes the article on bronchiectasis, which is beautifully illustrated by Dr. Sharkey's plates. The causation of bronchiectasis is fully discussed, and the author records his own views on the subject. As regards treatment, Dr. Arnold Chaplin's creasote inhalation method is strongly advocated.

Pneumonia is well described by Dr. Pye-Smith, who adds some valuable statistics and tables, which have been drawn up by Dr. J. H. Bryant and Mr. F. J. Stewart.

Eighty-six pages are devoted to an account of pulmonary phthisis by Dr. Percy Kidd. This is an excellent article, and will probably be one of the most generally useful in the volume. It will be referred to elsewhere. (See page 258.)

Pneumoconiosis is considered by Dr. J. T. Arlidge; and the rare affection known as pulmonary aspergillosis is described by Dr. Rolleston.

Dr. J. K. Fowler writes the account of emphysema.

The article on asthma and hay fever is contributed by Dr. Goodhart. As a preventive remedy, in the pure form, he thinks no drug is equal to arsenic; and for the relief of the paroxysm he regards a hypodermic injection of a sixth of a grain of morphine as the most useful remedy.

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Dr. J. K. Fowler describes syphilitic affections of the lungs, and records a number of interesting cases.

The second section of the book, devoted to diseases of the pleura, is introduced by an article by Dr. S. West on intra-pleural tension, considered from the physiological and physical standpoint.

Dr. S. Gee gives a very clear and practical account of pleurisy and its treatment; Dr. Herringham discusses the morbid anatomy and pathogeny; and Dr. D. Finlay contributes a concise description of pneumothorax.

The third section of the book is devoted to diseases of the circulatory system. An introductory article on the general features of the blood is written by Professor M. Foster. In this article we notice many important facts with respect to the variations in the reaction and the specific gravity of the blood, the changes occurring in normal blood in different parts of the body, etc., and it is important that these variations should be borne in mind in considering the pathological changes in the blood.

Dr. S. M. Copeman gives an excellent summary of the clinical examination of the blood, and succeeds in very clearly and concisely describing nearly all of the most important methods.

In an article devoted to "Cardiac Physics" Professor Sherrington describes the mechanism of the heart's action.

The account of chlorosis is contributed by Professor Clifford Allbutt. A very clear and interesting summary is given of the various theories as to the causation of the disease and the explanation of the venous and cardiac murmur, though it does not appear that any of them are quite satisfactory. According to Professor Allbutt "the physician who cannot treat chlorosis successfully with iron should abandon the practice of medicine." Hence his remarks on this subject will be read with attention. We find that he prefers the sulphate of iron alone, or with aloes, in the form of a pill. "The addition of an alkali to the iron is quite useless, and by making the pills more bulky is inconvenient." He administers "one grain of the sulphate thrice daily after meals for the first week, two grains in the second week, three grains in the third; it is rarely necessary to go beyond this." This dose of 9 grains daily he continues for two months, and then gradually reduces the quantity. He has also found iron "jelloids" very useful, and he wisely remarks that "incurable chlorosis may mean insoluble pills—as hard as pebbles and about as useful to the patient."

Dr. Sydney Coupland contributes a concise account of pernicious anæmia; he discusses the theory as to its causation, and accepts the view that it is due to a special form of blood destruction or hæmolysis, induced by toxic agents absorbed from the gastro-intestinal tract. As

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regards treatment, he places first the administration of arsenic, and next to it, that of intestinal antiseptics.

Dr. Samuel West's account of splenic anæmia is one of the best descriptions of this rare disease hitherto published, and fortunately it is based chiefly on an analysis of a number of well recorded recent cases, including one of his own.

Dr. Wickham Legg contributes the article on hæmophilia, in which the clinical features are clearly described. The negative results of careful pathological examination are disappointing, and Dr. Legg considers that the discussion of the pathogeny would be mere speculation, and really useless.

Dr. John Thomson furnishes a useful summary of the present state of medical knowledge with reference to hæmorrhages in new-born children.

The account of purpura, written by Dr. Stephen Mackenzie, is very interesting. A table is given of 200 cases of purpura in the London Hospital arranged as regards probable causes or associated conditions. In 61 cases the disease was associated with rheumatism; in 68 it was unexplained. Dr. Mackenzie states that in many cases of purpura rheumatica, oil of turpentine appears to act as a specific given in 10 or 12 minim doses.

A practical article on scurvy is contributed by Dr. W. Johnson Smith.

Dr. Cheadle gives an excellent account of infantile scurvy, scurvy rickets, or Barlow's Disease (as it is frequently termed on the Continent). The article is well illustrated by two coloured plates—one of the face, showing the spongy gums, and proptosis of the right eye, with ecchymosis and œdema of the upper eyelid, owing to a post-orbital hæmorrhage; the other, showing the swelling over the front of the tibia, due to a sub-periosteal hæmorrhage, and also the post-mortem appearance of the femur, surrounded by sub-periosteal hæmorrhage. The cause of this disease has been clearly traced to improper feeding. In 27 out of 37 of Cheadle's cases no fresh milk had been given for a long period previous to the attack. In the greater number of instances, however, the scorbutic condition arose from feeding on one or other of the proprietary preserved foods, or on pancreatised farinaceous food. The excellent results obtained in treatment by the use of fresh milk, potatoes, raw meal juice, and fresh vegetables, etc., are pointed out.

In the interesting article on hæmoglobinuria by Dr. S. Monckton Copeman attention is drawn to the frequency of a syphilitic history, and it is stated that in some instances permanent cure has followed the use of iodide of potassium and mercury.

A good account of leucocythæmia is furnished by Dr. Muir, and a beautiful illustration of the microscopical appearances of the blood is added.

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Dr. W. H. Dickenson contributes a well-written article on dropsy.

A detailed description of congenital diseases of the heart is given by Dr. Lawrence Humphrey.

In an article of eighty pages, Dr. F. T. Roberts contributes a very practical and careful account of diseases of the pericardium.

Functional disorders of the heart, including tachycardia, brachycardia, and syncope, are described by Professor Clifford Allbutt in a manner which differs from the usual cold tone of medical literature. This article is interesting, and the reader who has a sense of humour may be reminded that it contains some good medical anecdotes. Mechanical strain of the heart is also carefully considered by Professor Allbutt.

A short article on the "Injuries by electric currents of high pressure," written by Dr. Thomas Oliver, is probably the first on this subject which has appeared in any English text-book or system of medicine, and now that electricity is so widely employed, it is one which may be read with advantage by all engaged in medical practice. Whatever the cause of death may be in such cases, Dr. Oliver believes that no treatment is more likely to be beneficial than artificial respiration, carried out systematically according to Sylvester's method, and continued for half an hour or longer. He bases this statement on the results obtained by Bolam and himself in experiments on dogs.

The description of endocarditis, simple and infective, is written by Dr. Dreschfeld, and is the best and most concise account of this obscure ailment which can be found in English medical literature. The causation and pathology of infective endocarditis is considered in Vol. I., along with infectious diseases. As regards symptoms, four types of the infective or malignant endocarditis are recognised: (1) The septic or pyæmic type; (2) the typhoid type; (3) the cerebral type; (4) the cardiac or malarial type. The differential diagnosis is carefully discussed, and the value of Widal's serum test is pointed out in the diagnosis between enteric fever and infective endocarditis. In the diagnosis between the simple and the malignant form, the following symptoms are in favour of the latter disease: (1) Pyrexia, often of remittent or intermittent type, especially when accompanied by rigors at irregular intervals; (2) the anæmic appearance; (3) the enlargement of the spleen; (4) retinal changes—hæmorrhages and neuritis; (5) hæmorrhages in the skin and from the mucous membranes. The prognosis is very grave, but Dr. Dreschfeld mentions two cases which he has seen that have presented the symptoms of the disease and yet have recovered.

The various diseases of the myocardium are carefully considered by Dr. Douglas Powell.

The volume concludes with the description of diseases of the aortic and mitral valves. These articles are written by Professor Clifford

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Allbutt in a very practical manner, and his own valuable experience is frequently given. We are glad to find that the articles are illustrated by numerous excellent pulse tracings taken from the writings of Dr. Graham Steell, many of which have been published in the MEDICAL CHRONICLE.

It is scarcely necessary to add that in spite of the great diversity of the style and of the manner of treating the subjects, probably no single volume in the English language presents such an excellent account of the diseases considered.

PUBLICATIONS RECEIVED.

From Messrs. T. Fisher Unwin, London :—

"Masters of Medicine: Sir Benjamin Collins Brodie." (3s. 6d.) By TIMOTHY HOLMES, M.A., F.R.C.S.

From Smith, Elder, and Co., London :—

"Mineral Waters and Health Resorts of Europe (Revised and Enlarged Edition of 'The Spas and Mineral Waters of Europe')." (10s. 6d.) By HERMAN WEBER, M.D., F.R.C.P., and F. PARKES WEBER, M.D., F.R.C.P.

From William F. Clay, Edinburgh :—

"Guide to the Clinical Examination and Treatment of Sick Children." (9s.) By JOHN THOMSON, M.D., F.R.C.P. (Edin.).

From Messrs. Baillière, Tindall, and Cox, London :—

"Outlines of Practical Surgery." (12s. 6d.) By WALTER G. SPENCER, M.B., M.S., F.R.C.S.

From H. K. Lewis, London :—

"Practical Organic Chemistry." Second Edition. (2s. 6d.) By SAMUEL RIDEAL, D.Sc., F.I.C., F.C.S.

From the Rebman Publishing Co., London :—

"Atlas of Methods of Clinical Investigation, with an Epitome of Clinical Diagnosis and of Special Pathology and Treatment of Internal Diseases." (12s. 6d.) By Dr. CHRISTFRIED JAKOB. Edited by AUGUSTUS A. ESHNER, M.D.

From Messrs. John Heywood, Manchester :—

"Buxton: Its Baths and Climate." Fourth Edition. By SAMUEL HYDE, M.D.

From The Scientific Press, London :—

"Physiology: Experimental and Descriptive." (6s.) By BUEL P. COLTON.

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Local News.

APPOINTMENTS.

ALCOCK, REGINALD, M.B., Ch.B. (Vict.), has been appointed Honorary Assistant Surgeon to the North Staffordshire Infirmary, Hartshill.

ASHTON, G., M.B., Ch.B. (Vict.), has been appointed Assistant Medical Officer for the London County Asylum, Claybury.

BUCKLEY, S., M.D., M.R.C.P., F.R.C.S., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 8 County Court Circuit.

BURY, J. S., M.D., F.R.C.P., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 8 County Court Circuit.

COLLIER, JOSEPH, F.R.C.S., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 8 County Court Circuit.

JONES, A. EMRYS, M.D., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 8 County Court Circuit.

LITTLER, R. M., F.R.C.S., D.P.H. (Vict.), has been appointed a Medical Referee under the Workmen's Compensation Act, 1897, for the County Court Circuit which embraces the Southport and Ormskirk County Court Districts.

LUND, HERBERT, F.R.C.S., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 7 County Court Circuit.

MARTIN, J. M. H., M.D. (Vict.), F.R.C.S. (Eng.), L.R.C.P. (Lond.), has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for No. 4 County Court Circuit, which comprises Blackburn, Haslingden, Bacup, and Clitheroe.

MILROY, J.A., M.B., M.A., Junior Demonstrator of Physiology in The Owens College, has been appointed Demonstrator of Physiology in Yorkshire College, Leeds.

MYERS WARD, C. F., Senior Demonstrator of Physiology in The Owens College, has been appointed Lecturer on Physiology in University College, Sheffield.

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OWEN, S. H., M.D., M.R.C.P., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 8 County Court Circuit.

POMFRET, H. W., M.D., F.R.C.S., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 13 County Court Circuit.

STONEY, W. W., M.D. (Vict.), has been appointed Medical Officer of Health for Kimberley and Beaconsfield.

THORBURN, W., M.D., F.R.C.S., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 8 County Court Circuit.

TRUMPER, C. B., M.B., Ch.B. (Vict.), has been appointed Medical Officer for the Market Rasen First Sanitary District and the Tealby Sanitary District of the Caistor Union.

WILKINSON, W. A. H., M.B., Ch.B. (Vict.), has been re-appointed Medical Officer of Health by the Gainsborough Urban District Council.

WRIGHT, G. A., F.R.C.S., has been appointed Medical Referee under the Workmen's Compensation Act, 1897, for the No. 8 County Court Circuit.

YOUNG, M., M.D., C.M. (Edin.), D.P.H. (Vict.), has been re-appointed Medical Officer of Health for the Borough of Crewe.

THE OWENS COLLEGE STUDENTS' BAZAAR.

Through the generosity of the legatees of the late Sir Joseph Whitworth, and of Lady Whitworth, a large plot of land on The Firs Estate, Fallowfield, has been given to the College as a permanent athletic ground. The ground, which is ten acres in extent, is very pleasantly situated, and will afford space for cricket, football, lawn tennis, lacrosse, etc. The cost of levelling, draining, and preparing the ground, and of erecting a suitable pavilion, will probably amount to not less than £3,000. At a meeting of students representing all sections of the College, held on June 23rd, it was decided to hold a bazaar in St. James' Hall, in December next, for the purpose of raising the necessary funds. At least three stalls are to be provided by the present and past students of the Medical Department and their friends.

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THE MEDICAL CHRONICLE:

A MONTHLY RECORD OF THE

Progress of Medical Science.

REMARKS ON A CASE OF HEART DISEASE.

By GRAHAM STEELL, M.D., F.R.C.P.,

Physician to the Manchester Royal Infirmary and Lecturer in Clinical Medicine, Owens College.

The following case seems to be sufficiently instructive to justify the publication of a brief note of its clinical and pathological features as the text for a few remarks on the diagnosis of certain heart cases.

A. B., æt. 47, married at the age of 17, and the mother of eleven children, was admitted to the Infirmary on the 5th April, 1898. She was a stout woman, with fine vascular stigmata over the cheeks. At the age of 23 she had had rheumatic fever, and been confined to bed by it for fourteen weeks. At the age of 40 she had had another attack of rheumatism of less severity and shorter duration.

She had begun to suffer from shortness of breath five years before admission, and this symptom had become aggravated during the last year. Early in 1898 she had had dropsy of the lower extremities, but there was little evidence of this on admission. The liver was much enlarged and tender on pressure. The splenic dulness was increased. The urine was scanty, of rather low specific gravity (1015—20), and contained a large quantity of albumen; the deposits consisted of phosphates and oxalates, with squamous epithelium, but repeated examinations at different times failed to reveal the presence of casts. The urine contained no sugar. She had some cough and expectoration. Insomnia had been a troublesome symptom for some time.

There was visible venous pulsation in the neck. The apex beat of the heart was felt displaced to the left, and there was epigastric pulsation. The cardiac dulness extended upwards to the third cartilage in the left

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parasternal line, and its maximum extension from the middle line to the right and left respectively measured 1¼ inch and 5½ inches.

In the mitral area the first sound was present, followed by a systolic murmur. The second sound was audible, unaccompanied by murmur. The first sound was audible in the vertebral groove, unaccompanied by murmur. In the tricuspid area the first sound was present, followed by a systolic murmur, and the second sound was present. In the aortic area the first sound was audible, as was also the second sound, both being pure. In the pulmonary area the first sound was audible, followed by a systolic murmur. The second sound was present. The pulse was irregular (*vide* Fig. 1).

FIG. 1.—Tracing from A. B., showing common type of pulse in cases of mitral stenosis.

FIG. 2.—Tracing with similar essential characters, from a case of alcoholic muscle-failure of the heart. (P.M.)

The patient seemed to improve to some extent after admission, but never satisfactorily, and a diuresis occurred only on two days (27th and 28th April), under the influence of digitalin. Next day the quantity of urine had greatly diminished, and on the following days, until patient's discharge from the hospital, barely reached a couple of pints in 24 hours. Patient had no pyrexia. At her own request she was allowed to go home on the 7th May. She said she felt better.

Her insomnia had readily yielded to chloral amide. For the heart-failure, strophanthus, digitalin, and caffeine were employed at different times, but, with the exception noted above, all failed to establish a diuresis. She never seemed to be convalescent in any sense of the word. The albuminuria never diminished as it may be expected to do under treatment when dependent on the venous stasis of heart failure only. The specific gravity was usually low considering the small quantity of urine passed.

She appears to have become worse in less than a week after her return home, the old symptoms of dyspnœa and dropsy returning, and the

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former soon becoming so distressing that she had to take to her bed, where she remained till her re-admission to the Infirmary on the 2nd June. She was treated on the same lines as before, but with even less success. No diuresis could be obtained, the largest quantity of urine passed in 24 hours being only 50 oz. Strophanthus, digitalin, and caffeine all failed. Nux vomica was given almost continuously. She was taking caffeine at the time of her death, which occurred rather suddenly and unexpectedly on the 23rd of June, her condition, unsatisfactory though it was, not having become noticeably aggravated during the few days preceding death.

The physical signs on re-admission were practically the same as during her previous stay in hospital. The urine always contained a considerable quantity of albumen, and was of rather low specific gravity —1012 on one occasion—but casts were never found in the deposit.

Occasionally, though rarely, during her stay in hospital, the cardiac murmurs disappeared for a short period.

Post-mortem Report.—A little anasarca of lower extremities. Large irregular "milk patch" over right ventricle. Localised patch of adhesion over left ventricle. Much subpericardial deposit of fat.

Heart much enlarged, globular in form; weighs 11b. 12ozs. Right auricle dilated; walls slightly hypertrophied. Tricuspid orifice greatly dilated; valves slightly thickened; no vegetations. Right ventricle dilated; walls hypertrophied. Pulmonary artery normal. Left auricle much enlarged; very considerable increase in thickness of walls. Mitral orifice slightly contracted, barely admitting two finger tips; valve segments distinctly indurated, yellowish white in colour, of firm, tough, rigid consistency, a little irregular, and presenting one or two hard bead-like projections; no ulceration; no recent vegetations. Chordæ tendineæ shortened, and several distinctly thickened. Left ventricle much enlarged; cavity greatly dilated; great hypertrophy of wall—1½ inch thick. Aortic valves a trifle thickened; slight fenestration of intermediate cusp; no vegetations. Aorta: early atheroma. Orifices of coronary arteries patent. On section of coronary vessels very distinct, irregular atheromatous patches are found.

Lungs congested and œdematous; obsolete tubercle in both.

Liver much enlarged; weight 5lbs. 8oz.; typically "nutmeg." Gall-bladder completely occupied by large gall-stone.

Spleen weighs 14oz.; typically "cyanotic."

Kidneys: Right small, weighs 4½oz.; very movable; capsule adherent, surface irregular; cortex diminished, one or two small cysts; general increase in consistency; whole organ dark red in colour. Left a little larger than right; weighs 6½oz.; characters of early interstitial nephritis.

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Nothing of interest in other organs.

Remarks.—It was possible, in a way, during this patient's life to take one of three views of her case. (1) The case may have been regarded as one of "mitral incompetence" only, due to structural disease of the valves the result of the preceding rheumatic endocarditis; (2) as one essentially of mitral stenosis, having its origin in the same preceding pathological event, or (3) as one essentially of muscle-failure of the heart, the cause of such muscle-failure being alcoholism (denied), Bright's disease, adherent pericardium, or rheumatism itself affecting the myocardium, though this last view was hardly feasible under the circumstances.

(1) The history of rheumatic fever—evidently a severe attack—at the age of 23, made it most probable that there had been endocarditic changes in the valve curtains. We know that in most instances such changes eventuate in stenosis, but that the valves may be structurally and seriously damaged in function by rheumatic endocarditis, without the production of stenosis, must be admitted. In the typical case of this kind the murmur indicative of incompetence is well conducted to the back, which it was not in the case we are considering. The rule, unfortunately, like nearly all clinical rules, has many exceptions, and I remember a case of septic endocarditis in which the incompetence due to considerable structural damage of the mitral valves failed to produce a murmur in the vertebral groove, the first sound being there audible, unaccompanied by murmur. Again, in the case we are considering, the occasional though rare cessation of the murmur was opposed to the idea of incompetence of the valves being the cause of the disturbance of the circulation; and granting that the disturbance of the circulation had its origin in rheumatic endocarditis, the presumption seemed unquestionably to be that this had wrought its effect upon the circulation by producing stenosis.

(2) When patients who have had severe rheumatic fever years before come to us with symptoms indicative of disturbance of the circulation in its usual form—venous stasis—and the condition seems traceable to changes in the mitral valves, we know that in the large majority of such cases stenosis of the orifice is the lesion. What was the evidence in the case before us of the existence of this lesion? The murmur was always accompanied by the first sound of the heart, and in the vertebral groove was replaced by it altogether—precisely the condition we expect to find in cases of "mitral regurgitation through a constricted orifice." True, there was no direct murmur—neither presystolic nor diastolic—but who will deny that it is common to meet with mitral stenosis revealing its presence only by the indirect murmur of incompetence? If there is

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any type of pulse to be associated with mitral stenosis (Fig. 3), from a diagnostic point of view, it is exactly such a pulse as our patient had, and such as is portrayed in the accompanying sphygmogram (Fig. 1). Again, the liver was almost exceptionally large for a heart-case; and mitral

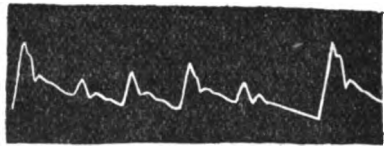

FIG. 3.—Typical pulse in case of mitral stenosis.

stenosis is the lesion of all others that brings its ill effects to bear with greatest force on the liver. The venous stigmata on the cheeks may again have been regarded as the remains of the circumscribed flushes on the cheeks that cannot be denied diagnostic value in favour of mitral stenosis.

Moreover, it may be said that a degree of mitral stenosis did actually exist. The orifice may be said to have been anatomically of normal size, or almost so, though, considering the size of the heart, it was relatively diminished.

(3) Was the case essentially one of muscle-failure of the heart? The auscultatory signs were exactly those of muscle-failure—the murmurs of mitral and tricuspid regurgitation—the mitral murmur following and not replacing the first sound at the apex, and being replaced by the first sound at the back. The pulse was quite compatible with this view, for the irregular pulse presented no feature that may not be met with in the pulse of a case of muscle-failure (*vide* Fig. 2). Presumably, however, if the case were one essentially of muscle-failure, it was not likely that the mitral valves were sound, in view of the rheumatic history. Again, in considering muscle-failure, it was necessary to seek an antecedent likely to produce this condition. Anæmia was out of the question; alcoholism was denied, and collateral evidence bore out the truth of the denial. The large number of pregnancies, with their associated periods of high blood-pressure, may, however, have been allowed their influence, but in this relation an important feature of the case requires attention—namely, the albuminuria. Albuminuria is so common in heart cases that one learns perhaps to attach less importance to it than it occasionally deserves. Rest in bed, and other treatment directed to the restoration of the circulation usually suffice to decidedly diminish or to remove the albuminuria of venous stasis, but in this case it may be said the venous stasis was hardly materially diminished by treatment; for instance, the liver remained large, and so one never wondered that the

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quantity of albumen in the urine remained considerable. My house-physician repeatedly examined the urinary deposit for casts, but without success. Possibly the use of larger depositing vessels might have been attended with success, for in all probability a *few* casts did find their way into the urine. A large amount of albumen in a heart-case may indicate no serious disease of the kidney, on the one hand, while a trace of albumen, on the other hand, in the highly concentrated urine of heart failure secondary to granular disease of the kidneys, may be all that reveals the most pronounced form of Bright's disease.

I may relate, from personal experience, a case in illustration of each of these statements. A stout, flabby man came periodically from a distance to consult me about local disease in one of his lungs. He was short of breath, and had visible pulsation in his neck, but had no murmur audible over his heart. I always found a large quantity of albumen in his urine, and concluded that he had Bright's disease. Repeated examination of his urinary deposit failed to demonstrate casts, however. At a later period I had an opportunity of examining this patient's urine when he was confined to bed, and great was my surprise not to find a trace of albumen then present, although the albumen returned when he got up again.

Many years ago I had under observation a man, between 50 and 60, with all the indications of muscle-failure of the heart, including dropsy and pulmonary apoplexy. His urine was scanty, and deposited lithates copiously, but it contained only a trace of albumen. A considerable quantity of albumen, under the circumstances, by itself, need have raised little or no suspicion of independent kidney disease. Yet this man was proved to have exquisite granular kidneys a few days later!

When I attended the autopsy of the case that forms the subject of these remarks, I had to give the pathologist an alternative diagnosis—mitral stenosis or muscle-failure of the heart. There seemed to be no sign that decided in favour of the one or the other, unless it were the history of rheumatism. I confess I had given too little heed to the albuminuria, but albuminuria as a quite secondary symptom of heart disease is exceedingly common, and a few casts may be found in the deposit under the circumstances, although the kidney structure has sustained no serious damage. Moreover, had casts been found in plenty in the case of A. B., the ready explanation of their presence would have been a tubular nephritis supervening on venous stasis, such as is not a very rare occurrence. Granular disease of the kidneys is a disease with which we meet under most curious symptoms clinically; it is notorious how often its final symptoms are really, as well as apparently, those of heart disease—dyspnœa, dropsy, engorged liver, pulmonary apoplexy, etc., but they may be intractable vomiting and stomach suffering only,

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or they may be referable to the brain and nervous system only. Lastly—and the importance of the fact is great—the quantity of albumen present in the urine in a case of granular kidney may be insignificant, as in the case I have already referred to, or as in another in which the minute trace of albumen seemed readily accounted for by the presence of a little pus due to an old cystitis, and in which there were no high arterial pressure, and no cardiac hypertrophy. The specific gravity of the urine again need not be significantly low, and the colour of the urine may be quite normal, while lithate deposits still further direct our attention from a disease which the books still lead the student to infer is always associated with a pale, clear, and copious urine.

The post mortem examination of A. B., it may be said, demonstrated no heart failure, seeing that the walls of the left ventricle are stated by the pathologist to have been "an inch and a half thick," but we have at the same time his statement that the cavity was "greatly dilated." The size of the cavity rather than the thickness of the wall must be taken as the measure of "muscle-failure of the heart," and there can be little doubt that, as Sir William Broadbent suggests, the quality of the heart muscle in different cases has to be taken into account apart from any obvious change in its appearance and consistence. Was the fibre of this heart so poor that the muscle had to hypertrophy to such an extent to maintain the circulation in the presence of a by no means extreme granular disease of the kidneys, and a by no means pronounced lesion of the mitral valve, or was it that the combination of the two conditions required such response? In any case there is always a limit to hypertrophy, and the overgrown tissue is probably never of the best quality. At all events, from a clinical point of view, the co-existence of hypertrophy and functional incompetency need not at all surprise us, for it is not rarely met with.

A concluding remark may be made on the condition of the spleen. In ordinary heart cases, venous stasis tells chiefly on the liver, the ready distensibility of which seems to protect the spleen in most cases from the effects of the stasis. When the liver itself is the seat of the obstruction, as in cirrhosis, on the contrary, the spleen is often enlarged. Dr. Kelynack* gives the average weight of the spleen in cardiac and hepatic cases respectively thus :—

Hepatic spleen in males.....	14·25oz.	In females	11·62oz.
Cardiac „ „ „	7·32oz.	In „	7·32oz.

In heart-cases, however, the spleen may be enlarged from causes other than venous stasis, as from the hæmorrhagic infarction of ordinary cases and the toxæmia of septic endocarditis. In the present case, had special

* *Birmingham Medical Review*, February, 1897.

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importance been attached to the splenic enlargement, interstitial hepatitis would have been the most ready explanation of the condition; but the history was opposed to it. In relation to cirrhosis, it may be noted that sharp hæmorrhage from the bowel is an occasional, though rare, symptom in pure heart disease, and in most instances seems to depend on embolism of mesenteric arteries. A few months ago I had a female patient with mitral stenosis, who recovered from severe hæmorrhage from the bowel, apparently due to such embolic infarction. She had sudden abdominal pain and symptoms of shock, followed later by a large discharge of blood from the bowel. Many years ago I witnessed similar symptoms in a heart-case, but the patient died, and on post mortem the lesion in question was demonstrated.

THE CLINICAL ASPECTS OF ACUTE PANCREATITIS.

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Acute pancreatitis seems to be such an uncommon affection, and its diagnosis so difficult, that the following account of the clinical aspects of the condition may be of interest.

The pathological aspects of the disease are dealt with in the next article by Dr. F. C. Moore, who very kindly undertook the examination of the specimen obtained from my case.

On the evening of February 10, 1898, I was called in consultation by Dr. John Scott, of Manchester, to see Mr. A. B., who had somewhat suddenly developed some dangerous symptoms. The history was as follows: The patient was aged 29, and a hotel proprietor, and said to be of temperate habits. In May, 1897, he had an attack of pain in the epigastrium, followed by incessant vomiting, the pain and vomiting being relieved by hypodermic injections containing morphine and atropine, and the attack gradually passed off in about three or four days. In June, 1897, he had another, but more severe, attack of a similar nature, but the pains were rather higher, apparently over the cardiac region and shooting down the left arm, and during the attacks the heart was fluttering and irregular. The attacks were thought by Dr. Scott to be due to angina pectoris, but a physician who was consulted thought them more probably pseudo-anginal in nature. It should be mentioned in this connection that the patient was a heavy smoker. Another sudden

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attack of pain and vomiting occurred in December, 1897, but now the pain was more distinctly epigastric, shooting from right to left across the upper abdominal region, and slightly upwards into the chest. Again the symptoms were relieved by morphia and atropine, the whole attack lasting about four days, leaving the patient weak but otherwise quite well. As it was supposed to have some connection with food, the patient was now very careful in his diet. No jaundice ever occurred either during or after the attacks.

On February 5, 1898, the patient returned from a holiday and was in good health, as indeed he had been since his last attack in the previous December. On the morning of February 6, he suddenly commenced with his old pains across the epigastrium, very acute in character, followed by severe vomiting. He was treated by the same hypodermic injection of morphia which had relieved him on so many occasions; this solution contained one grain of morphia and $\frac{1}{30}$ grain atropia in 10 minims. An injection of 6 minims of this solution was given morning and evening on February 6, relieving the pain and vomiting for a time. A similar dose was given on the morning of February 7, and at about 8 p.m. on February 7 a dose of 8 minims was given, this amount containing $\frac{4}{5}$ grain morphia and $\frac{1}{45}$ grain atropine. This again stopped the vomiting and pain, but in an hour and a half the patient became suddenly delirious. I saw the patient about 11 p.m. and found him apparently suffering from typical atropine poisoning. The pupils were widely dilated and did not act to light, the mouth and throat were dry, the skin was dry, and the extremities were cold; there was a slight scarlatiniform rash on the arms and chest; the pulse was weak and beating at the rate of 170 per minute. There was the apparently typical delirium of atropine poisoning, with very marked hallucinations and illusions of vision, not altogether unpleasant in character and with practically no lucid intervals, any interval being only a few seconds in duration and hardly sufficiently long for him to finish the answer to a question. Though we thought it strange that so small a dose of atropine should produce such symptoms (and especially as he had had similar doses before), yet they appeared to be so characteristic that we injected $\frac{1}{45}$ grain of eserine. Within ten minutes the patient was quieter, his pulse dropped to 120 per minute, and he passed a fair night. The next day (February 8) the delirium had practically disappeared and the pain and vomiting had entirely ceased, and, though weak, yet he was quite rational. I was again asked to see him in order, if possible, to discover the cause of his frequent attacks. I saw him in the afternoon, when he gave me a careful history of his illness. From his expression he appeared to have two or three slight visual illusions during the entire interview of about half an hour's duration. His pupils were normal, his pulse still 120, and he

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had no pain; the heart sounds were normal. The abdomen was rather resistant, especially in the epigastrium, where it was somewhat prominent and tender on deep pressure. I thought that the attacks might be anginal in nature, probably pseudo-anginal, secondary to gastric disturbance; the attack on the previous evening I still considered at that time to be caused by the atropine.

About 10 p.m. the pain again commenced, and half a grain of morphia solution, containing no atropine, was given. At midnight the doctor again came for me, and we found the patient in a state of wild, acute delirious mania, fighting with his attendants, and constantly screaming. He had again all the symptoms of atropine poisoning—pulse 180, and the pupils widely dilated—but the delirium was more acute than I have previously seen in atropine poisoning. The extremities were very cold and blue, and the breathing was very rapid. In about an hour the patient rather suddenly became quieter, the pulse dropped rapidly to 100, and the breathing became easier. Then, very suddenly, the head rolled over on the pillow, and the breathing absolutely stopped; the heart, however, continued to beat slowly and feebly for a few minutes, then stopped, and the patient was dead—about 60 hours after the beginning of the attack.

I made a post-mortem examination eight hours after death. The body was well nourished, but not unreasonably fat. There were two patches of fairly recent caseation in the apex of the left lung. The heart muscle, excepting the capillary muscles in the left ventricle, which were rather fatty, was normal. There were several patches of atheroma in the aorta, just above the aortic valves; there were more prominent patches of atheroma in both coronary arteries, but these were not absolutely blocked, though the lumen of both was distinctly narrowed. The mitral valve was normal, but there was a patch of atheroma on one cusp of the aortic valve, not however sufficient to distort the cusp. The liver was slightly enlarged, fatty, and slightly cirrhotic, and there was early interstitial nephritis. The stomach appeared to be normal. The first six inches in length of the duodenum, where this was applied to the head of the pancreas, was much discoloured, very thin, and friable, so that it tore almost like wet paper, and the mucous membrane was eroded in small points; this appearance terminated somewhat suddenly about six inches from the pylorus, the intestine below being normal. There were no gall stones. The pancreas was much enlarged and very hard, and felt like a tumour stretching across the back of the abdomen, and it was rather firmly adherent to the parts around by old adhesions; on removing it there was a strong gangrenous stench. On section, the organ was rather hard, especially at the tail; the lobules were enlarged and very clearly marked off from one another, especially at the head, which did

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not seem to be so much affected as the tail, for here there was a dark gangrenous-looking patch the size of a walnut. There were recent hæmorrhages, not only in the fibrous capsule of the pancreas, but also scattered here and there through its substance, and there were also seen several patches of dark pigment, probably due to old hæmorrhages. There was no noticeable change in the other contents of the abdomen. The head was not examined. The pancreas and duodenum were handed to Dr. Moore, in the Pathological Laboratory of the Owens College, within an hour of their removal.

Ætiology.—There is but little known of the ætiology of acute pancreatitis. As regards age, it is said to be more common in persons beyond middle life, but in fourteen recently reported cases the average age is 37. It is apparently slightly more common in males than females. It is found more frequently in persons addicted to the excessive use of alcohol, and more often in fat persons than lean. It is often associated with a preceding history of indigestion or prolonged gastric pain (Stevens[16]), or with a history of gall-stones, sometimes afterwards found impacted in the bile duct (Kennan[7] and Smith[17]), and finally it has been known to follow a blow on the abdomen (Rolleston[15]).

Symptomatology.—As a rule the symptoms come on quite suddenly with pain (generally severe in character) in the epigastrium, perhaps more often shooting upwards than downwards. In Koetschau's[8] case the first attack of pain was in the cardiac region, and this gradually passed off and left transient pains in the epigastrium. The pain sometimes disappears after some hours, and reappears on the following day. As a rule the pain is soon followed by vomiting, first of the stomach contents and then of bile, and rarely of fæces (Allina[1]). With the vomiting is associated constipation, and great collapse comes on. There is often a feeling of fulness in the epigastrium, and this region is rather prominent, resistant, tympanitic, and tender on deep pressure. The rest of the abdomen may be retracted. The temperature in the early stage may be raised to 100° or 102° F., but in some cases is low throughout the whole course of the disease. The pulse is often increased in frequency, and in the stage of collapse is not only very frequent but almost imperceptible, and the extremities are blue and cold. The urine has never, so far as I can find, been found to contain sugar (as so often occurs in chronic interstitial pancreatitis), but occasionally contained albumen, granular and hyaline casts, and a few red blood cells (Paul[14].)

It is not infrequent for the initial symptoms of pain and vomiting to disappear after the first day, leaving only the collapse, which may lead to death. In other cases the pain and vomiting reappear before the final collapse and death. Death generally seems to occur within one-

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and-a-half to five days in severe cases. In some cases, as in mine, there seems to be no doubt that previous attacks had occurred, such as in the cases related by Dittrich[3], Rolleston[15], and McPhedran[10]. That the previous similar attacks of pain were due to the pancreatic condition, in my case, seems to be proved by the presence in and round the pancreas of old hæmorrhages, and by the large quantity of fairly firm fibrous tissue which surrounded the organ.

The extraordinary delirium which was present in my case is peculiar. I have only been able to find one similar case recorded, namely in Case XX, mentioned by Fitz[4] and recorded by Hilty,[6] in which sudden violent delirium occurred. I have also heard of similar acute mania coming on in a case of acute pancreatitis which was under the care of Dr. Dreschfeld at the Manchester Royal Infirmary. It is certainly very remarkable that the appearances were so like those of atropine poisoning, and this would, I think, point to some toxine being the cause of such symptoms; indeed, according to Martin[11], an alkaloid resembling atropine in its action has been separated from decomposing animal matter, and, again, from putrefactive changes in the intestine (secondary to obstruction, for instance) there is probably a poison produced which causes the great prostration and collapse, and the rapid low-pressure pulse so often found in these cases. In my case I do not think that the atropine given had anything to do with the symptoms, because, after the lapse of one day, during which the symptoms were more or less in abeyance, there was a recurrence in a similar but much more severe form, without any fresh atropine having been given. Moreover, it must be remembered that the same dose of morphine and atropine had been previously administered on several occasions to the same patient without similar symptoms being produced.

Occasionally, if the patient survives the attacks, he may remain well for weeks or months, but another attack may then come on as I have already said. In other cases, Fitz[5] states that symptoms resembling those of localised peritonitis may ensue. "The abdominal swelling increases in size, even to an enormous degree, and is either general or limited to the epigastrium or to the left half of the abdomen. The distended abdomen is usually tympanitic, but it may be dull in the flanks. Moderate abdominal pain, at first apparent in painful and tender spots, and due to disseminated fat necrosis, becomes more general, vomiting and diarrhœa are frequent, and the patient loses flesh and strength. A severe paroxysm of lancinating pain may supervene during the third or fourth week, followed by frequent and copious discharges from the intestine, and disappearance of the abdominal swelling as the exudation from the bowels is evacuated. In the most prolonged cases of suppurative pancreatitis, extending over a period of months, ascites or anasarca

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may occur, and a bronzing of the skin and glycosuria have been noted." In addition to suppuration, sloughing and even detachment of the pancreas may occur.

Diagnosis.—The best guide to the diagnosis of this obscure affection is that tersely given by Fitz.[5] He says: "Acute pancreatitis is to be suspected when a previously healthy person or a sufferer from occasional attacks of indigestion is suddenly seized with violent pain in the epigastrium, followed by vomiting and collapse, and in the course of 24 hours by a circumscribed epigastric swelling, tympanitic or resistant with slight elevation of temperature." To this I would add the importance of enquiring whether any similar previous attack had occurred, either at a long interval of time or within the previous few days.

The conditions to be diagnosed from pancreatitis are: (1) Intestinal obstruction; (2) irritant poisoning; (3) perforative ulcer of the stomach or duodenum; (4) biliary colic; (5) aneurism in the neighbourhood of the cœliac axis; (6) angina pectoris.

(1) A considerable number of cases have been diagnosed as acute intestinal obstruction, and laparotomy has been performed, almost always followed by death. It may indeed be very difficult to distinguish the two conditions; but the suddenness of the onset with the great initial pain and the absence of conspicuous general tympanitis or limited distensions of intestinal coils, with the presence of localised epigastric tenderness, together in some cases with a history of previous attacks, may enable us to exclude intestinal obstruction.

(2) Irritant poisoning may be excluded by the history and by an examination of the vomit, but in some cases of ptomaine poisoning from food there might be great difficulty, and especially in such cases as the one I report, where marked delirium is present. In irritant poisonining, however, diarrhœa is more frequently present than constipation.

(3) Perforation of an ulcer of the stomach or duodenum can in many cases be excluded by the previous history, by the absence of pain after food, hæmorrhage from the stomach or intestine, and in the case of perforated gastric ulcer by the presence of vomiting.

(4) Biliary colic may be very difficult, if not impossible, to exclude at the commencement of the attack, but if the patient lives the absence of jaundice may be of assistance. A history of similar previous attacks, unattended with jaundice, is, of course, in favour of acute pancreatitis.

(5) Aneurism in the neighbourhood of the cœliac axis is not always easy to exclude, especially if there is apparently a pulsating tumour in the epigastrium perhaps associated with a systolic murmur.

(6) Angina pectoris is only to be suspected when the pain shoots across or through the chest, and especially, as in my case, if the pain

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has ever shot down the left arm. (In the case I report it is just possible that one attack of pain was anginal in character, for there was some atheroma of the coronary arteries found after death.) The vomiting, constipation, and raised temperature are, of course, opposed to the diagnosis of angina pectoris.

It will be readily understood, as the symptoms of acute pancreatitis are so common to many other affections, that but few cases have been diagnosed before death. Fitz diagnosed one case which was verified by post-mortem examination; Milnes[12] diagnosed another which recovered; and Osler[13] and Körte[9] each diagnosed one after the abdomen had first been opened.

Prognosis.—There is no doubt that acute pancreatitis is an extremely fatal affection, especially when we remember that if the first attack does not kill a recurring attack may do so. Cases, however, have been described (in which there was either little or no doubt of the existence of the affection) where recovery took place. Besides the tendency to recur, we must remember the possibility of suppuration or sloughing of the pancreas taking place with the subsequent results.

Treatment.—This is not satisfactory. For the pain and vomiting local hot applications to the epigastrium may be of service, but far better are subcutaneous injections of morphia. For the collapse stimulants and strychnine may be given, and Cayley[2] recommends extract of suprarenal capsule to increase the arterial tension. Milnes seems to think from his case that the administration of enemata caused the vomiting and pain to recur. In my case the eserine given (under the idea that the patient was suffering from atropine poisoning) certainly improved the condition of the pulse, and quietened the delirium. If the acute stage passes off, but suppuration or gangrene follows, then surgical interference is necessary. That a gangrenous pancreas can be removed is shown from Trafoyer's[19] case in which a patient was alive 17 years after the sloughed pancreas had been discharged by the bowel.

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THE PATHOLOGICAL ASPECTS OF ACUTE PANCREATITIS.

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Acute pancreatitis presents so many features of pathological interest, and at the same time is of such rarity, that I venture to record in detail the lesions found in Dr. Reynolds' case, and discuss their nature so far as this case is concerned. The clinical aspects and much of the literature have already been fully dealt with by Dr. Reynolds, and to his paper the following account is intended to be in a sense supplementary :—

The patient, a man, æt. 29 years, succumbed after a brief but severe illness of about 2½ days duration, chiefly characterised by intense epigastric pain, vomiting, constipation, and delirium.

At the *autopsy* the body was found to be "well nourished" and free from jaundice and dropsy.

Abdomen.—*The peritoneum* was apparently normal, except over the pancreas and adjacent part of the duodenum, where it was thickened and congested as the result of old and recent inflammatory changes.

The Liver was somewhat enlarged, slightly granular, and on section appeared fatty. The gall-bladder and larger ducts were apparently normal. Sections of the common bile duct lying between the head of the pancreas and the duodenum showed a condition of catarrhal inflammation.

The Stomach was normal, the mucous membrane exhibiting no gross lesion.

The Duodenum presented a very remarkable condition in its first and second parts. The wall was thin, friable, and had a sodden appearance and dark reddish brown colour. Where it came into relation with the head of the pancreas it was firmly adherent to that organ, and could

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only be separated from it by tearing through the muscular coats. The inner aspect showed a marked diminution in the size of the valvulæ conniventes; the bile papilla was very obvious and its orifice patent; a probe passed readily into and along the common bile duct, but less readily into the pancreatic duct, owing to the presence of some inspissated secretion. The mucous membrane itself was soft, dark reddish brown in colour, and in many places eroded to various depths. About one inch below the bile papilla, the mucous membrane abruptly assumed a more normal appearance, the valvulæ being well marked, of normal consistency, and only slightly congested. Microscopic examination revealed a condition of severe necrotic inflammation, the epithelium covering the villi for about three-fourths of their extent was in a state of coagulation necrosis. In some places the villi to the same extent were quite absent. The cells lining the follicles of Lieberkühn showed various phases of cloudy swelling and fatty degeneration. In the connective tissue cores of the villi, and also in the submucosa the vessels were congested and surrounded by aggregations of leucocytes. A similar condition but less marked was found in the muscular coat, and the muscle cells themselves in many places were in a condition of hyaline degeneration.

The remainder of the alimentary canal presented no obvious macroscopic lesion.

The Pancreas was somewhat enlarged, weight 145 grammes, firmly adherent to the surrounding structures, and increased in consistency, so that it formed a tumour at once striking by its size and firmness.

Externally it was invested by a considerable amount of fat, and in many places, especially about the body of the organ, by firm yellowish grey masses, which proved to be decolorised blood clot. In other places recent hæmorrhages appeared in the tissue immediately adjacent to the capsule; these varied in colour from a bright red to a dark purple. Altogether the organ had a most remarkable mottled appearance, conveying at once the impression of some extensive hæmorrhagic lesion.

On section, the head appeared fairly normal, the lobules were perhaps better defined than normally, and the gland parenchyma, which was firm to the touch, had a salmon pink colour; in the tail the appearances were practically the same; in the body, however, striking changes were present in the form of several irregular areas, about a quarter to half an inch in diameter—of a dark grey or greyish green colour, of somewhat soft consistency, and in which no trace of gland structure was visible. Immediately around these necrotic areas the interstitial tissue was much increased in extent, and presented here and there a hæmorrhagic appearance, the gland tissue in the same parts had a dark red colour. Passing away from the necrosed centre, this

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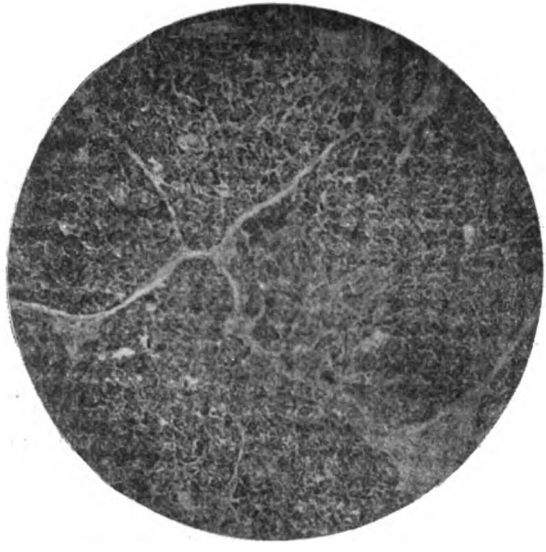

FIG. 1.—Section through head of pancreas; practically normal. × 40.

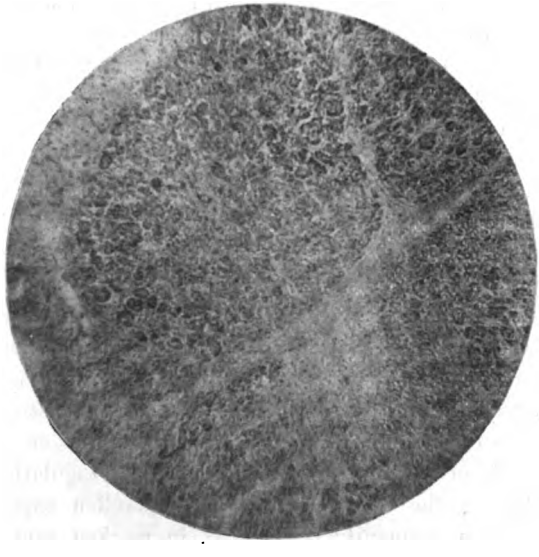

FIG. 2.—Section through margin of a diseased patch. Partial degeneration and atrophy of the cells of one lobule, together with small-celled infiltration. Interlobular tissue seat of some inflammatory exudation. × 40.

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marked interstitial infiltration terminated somewhat abruptly towards more normal pancreatic tissue, or if near the surface, became continuous with the masses of peripancreatic exudation.

In the peripancreatic fat, two opaque yellowish white nodules, about the size of small peas, were noticed; on section they contained a greyish white mortary débris.

Microscopic Examination.—Pieces were selected for examination from the head and tail, where the condition of the gland appeared but slightly removed from the normal, and from various parts of the body, including the necrotic areas, their margins, and the pericapsular exudations.

The surface of the pancreas was invested in many places by a mass of inflammatory exudation, attaining a thickness of half an inch, and extending outwards into the peripancreatic fat and inwards between the gland lobules. This exudation consisted in great part of numerous decolorised red blood corpuscles and mononuclear and multinuclear leucocytes lying in a fibrin network. Here and there the leucocytes were aggregated together in purulent foci, and the majority of them contained dark-brown particles of disintegrated blood pigment. In the midst of this exudation small tracts of spindle-shaped cells and connective tissue fibres were occasionally seen—the remains of the capsule of the pancreas. In some places the exudation presented a structureless granular appearance, staining diffusely with hæmatein, which was apparently the result of secondary necrotic changes; in other places, small groups of necrosed fat cells were found in the midst of the exudation, surrounded by a zone of disintegrating blood pigment. The pericapsular fat in a few places was the seat of extensive hæmorrhage, the fat envelopes being widely separated and in some cases invaded by recent blood. (Fig. 6.) The small veins in these situations contained thrombi distinctly adherent to the vessel wall. In the gland itself the sections through the head and tail showed but little change (Fig. 1); the interlobular tissue was slightly increased in extent, more by a serous than a cellular exudation, the pancreatic cells and those of the ducts appeared normal, in a few of the former slight granular changes alone being manifest. Sections through the body showed irregular areas of intense inflammatory change, situated in the midst of comparatively healthy tissue.

The centres of such areas were occupied by two or three gland lobules, the cells of which were in a condition of coagulation necrosis. (Fig. 3.) Among the necrosed cells small swollen capillaries, also necrosed, could be frequently seen; and, in marked contrast to the necrosed elements, were a few well-stained mononuclear leucocytes. The interlobular tissue was apparently increased in extent, and showed the same condition of necrosis. Immediately around these centres of

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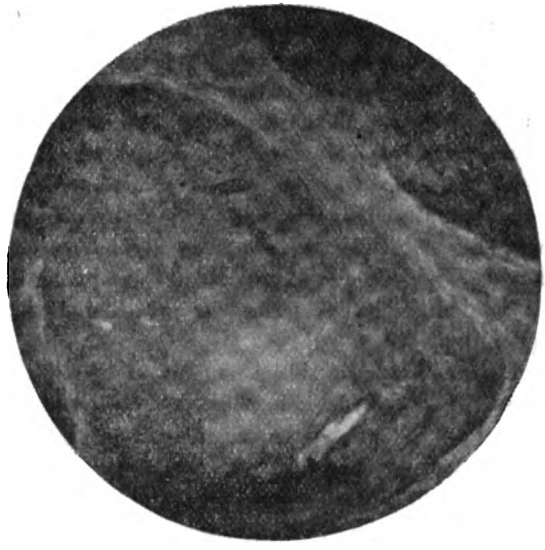

FIG. 3.—Section through centre of diseased patch. Complete necrosis and disintegration of the gland lobules, and inflammatory products. × 40.

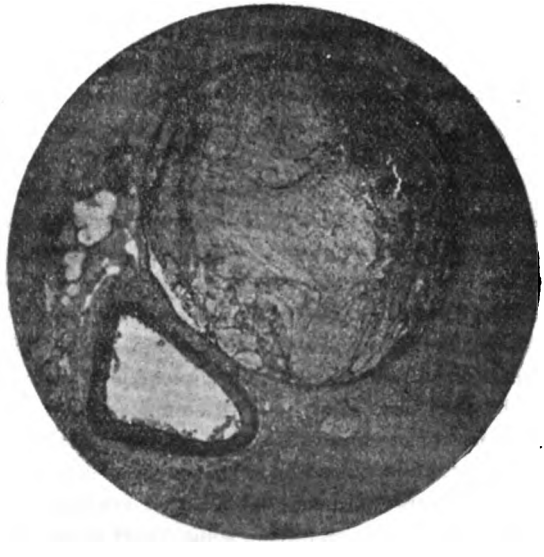

FIG. 4.—Interlobular artery and vein. The former normal, the latter thrombosed. [Surrounding tissue infiltrated with fibrino-cellular exudation. × 50.

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necrosis the interstitial tissue of the gland was the seat of an inflammatory infiltration, the gland lobules being widely separated by a fibrino-cellular exudate, presenting exactly the same characters as that already described as investing this part of the pancreas and with which it was directly continuous. In the midst of this exudate small purulent foci, recent hæmorrhage, foci of necrosis, and isolated and necrosed fat cells could also be seen. Of the structures contained in the gland stroma, the veins appeared dilated, and contained adherent thrombi of various ages. (Fig. 4.) The arteries were normal, as also were the nerves. The ducts presented catarrhal changes, and contained in many places small laminated bodies formed of inspissated secretion (not calcified). (Fig. 5.)

The gland parenchyma in this zone (Fig. 2) was also the seat of distinct changes. These consisted in necrosis and atrophy of the cells of the peripheral acini in each lobule, associated with an infiltration of the interacinous connective tissue with mononuclear and a few multinuclear leucocytes. As a result of these changes, many of the lobules were represented by a small group of acini, composed of well-stained slightly granular cells, surrounded by a zone of necrosed acini, separated from one another by a cellular infiltration continuous with the inflammatory products in the interlobular tissue.

Throughout this inflammatory exudation there was marked evidence of the disintegration of red blood corpuscles, in the granules of disintegrating pigment in the leucocytes and connective tissue corpuscles, and in the frequent occurrence of small masses of hæmatoidin crystals. These areas varied considerably in extent, and appeared to be somewhat abruptly limited, the intervening tissue showing comparatively slight changes.

Bacteria.—From the pancreas, which was received about 9 hours after death, various media—peptone-bouillon, gelatine, agar-agar, and blood serum—were inoculated from the necrosed areas, all precautions being taken to avoid contamination. In about 24 hours there were copious growths on all the media, which proved to be pure cultures of a single organism, a small sluggishly motile bacillus which subsequently gave all the reactions of the bacillus coli communis.

In sections stained with Loeffler's methylene blue and with thionin-blue a similar bacillus was found in small clumps lying in the midst of the necrosed areas, but in no other situation. The distribution of this bacillus, its localisation in the areas of most extensive change, and its occurring in pure culture 9 hours after death are facts which afford good grounds for regarding it as having some direct causal relation with the lesions described, and certainly not as a mere post-mortem contamination.

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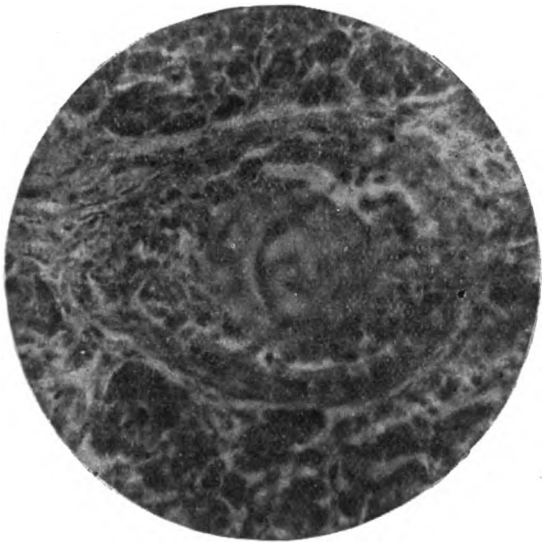

FIG. 5.—Small pancreatic duct, showing catarrhal changes, and containing a mass of inspissated products (not calcified). × 100.

FIG. 6.—Section through the peripancreatic fat, showing thrombosis of the veins and recent hæmorrhage among the fat cells. × 40.

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Briefly summarising the changes found in the pancreas, it appears that we have to do with an acute inflammatory lesion, associated with the presence of the bacillus coli communis, and characterised by its distribution in irregular patches in the body of the organ, by a fibrino-cellular exudation in the interstitial tissue and the capsular and peri-capsular tissues, by venous thrombosis and a peculiar tendency to hæmorrhage, by the occurrence of necrosis of the glandular tissue agreeing in distribution with that of the interstitial change, and by the necrosis of groups of fat cells in the pericapsular and interlobular tissues. Associated with this condition of the pancreas, we further noted the existence of a curiously limited acute necrotic duodenitis.

Although examples of acute pancreatic inflammation have been recorded from time to time during the last two centuries—one of the earliest being that of Tulpius,[24] 1641—still the condition was not seriously recognised until Fitz,[5] by his own observations and the compilation of numerous scattered cases, had placed it on a scientific basis.

As in other glandular organs—kidneys, liver, salivary glands, etc.—the results of irritation in the pancreas may be divided according as they primarily and more especially affect the essential cellular elements, the supporting stroma, or both sets of tissues, into parenchymatous, interstitial, and mixed inflammations.

Acute Parenchymatous Pancreatitis appears to be a fairly frequent condition, manifesting itself pathologically by various swelling and congestion of the organ, and by such qualitative protoplasmic changes in the gland cells as cloudy swelling, granulation, fatty degeneration and vacuolation, and nuclear proliferation. It is an almost constant feature of all severe toxæmic conditions, and, like similar changes in the liver and kidneys, is found associated with the specific fevers—typhoid, pneumonia (Freidreich[6]), septicæmia, etc.—and with poisoning by the irritant inorganic poisons.

Clinically considered, the lesion appears to be of little consequence, or its manifestations are quite overshadowed by those of the general condition.

Interstitial Pancreatitis.—Inflammation of the stroma of the gland without secondary or concomitant parenchymatous changes is, as in other organs, practically unknown. All forms of pancreatitis, except, perhaps, the so-called parenchymatous which, by the adherents of Cohnheim's school, would not be admitted to the dignity of an inflammatory lesion, are mixed.

In duration, intensity, and distribution they present many varieties, the more chronic characterised by increase in the connective tissue stroma of the gland associated with atrophy and degeneration of the secreting cells, constitute a condition of so-called "cirrhosis," which has

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been rendered familiar by the numerous investigations of the organ in cases of pancreatic diabetes. The more acute forms, to which the case under consideration obviously belongs, are divided into three groups—the hæmorrhagic, suppurative, and necrotic or gangrenous—taking their names from the most prominent feature of the morbid condition. As in most other classifications of morbid phenomena, these groups are not distinctly circumscribed and but indefinitely exclusive; thus in the preceding description we noted the existence of hæmorrhage, foci of suppuration, and considerable tracts of necrosis. Of these features, however, the second falls into insignificance in comparison with the first and last, and so this particular case may be correctly designated as a necrotic pancreatitis associated with hæmorrhage, or, to use a term employed by Russel and Leith,[21] as a "necrotic hæmorrhagic pancreatitis." These two conditions of hæmorrhage and necrosis are of considerable interest, and have received a variety of explanations.

There seems to be but little doubt that hæmorrhage into and around the pancreas may occur independently of inflammation; numerous examples of this condition of "apoplexy" have been recorded and variously ascribed to traumatic influences (Prince,[19] Foster, and Fitz[5]); diseases of the vessels, especially atheroma (Prince,[19] Seitz[22]); embolism of a pancreatic artery (Mollière[15]); extreme passive congestion, the result of disease of the heart or lungs (Kollmann,[13] Klob,[12] Seitz[22]); changes in the blood, scorbutus, pernicious anæmia, phosphorus poisoning (Seitz[22]); fat necrosis (Balser,[1] etc.); fatty infiltration of the pancreas (Hooper,[8] Zenker[26]).

The records of many of these cases are unfortunately incomplete, in that the macroscopic conditions alone are described; still there remains sufficient evidence to place the occasional occurrence of pancreatic apoplexy, with its invariably fatal termination, beyond doubt. Coming now to the hæmorrhage associated with acute inflammation, there are many cases recorded of which it is difficult to say whether the hæmorrhage is primary to the inflammation or whether it is the result of extreme inflammatory congestion. Balser[1] would assign most cases to the former category, since he regards fat necrosis as the initial lesion, and hæmorrhage, inflammation, and necrosis as secondary conditions. Seitz[22] also regards the demonstration of inflammation as a cause of considerable hæmorrhage as less clear and complete than one might wish. In Dr. Reynolds' case, the occurrence of thrombosed veins in direct relation with the hæmorrhages, points, I believe, to extreme congestion —the sum of the inflammatory congestion and the venous obstruction—as the most probable cause of the hæmorrhages; that it is not necrosis of the vessel walls is shown by the absence of hæmorrhage in the necrosed areas, and by the occurrence of necrotic changes in the exuda-

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tion itself, which indicates that necrosis occurs at some later period in the sequel of events, and also by the occurrence of hæmorrhage in parts from which retrograde changes are absent.

As regards the retrograde changes themselves, the microscopic examination shows two distinct conditions—the one seen in the cells of the peripheral acini of the lobules in the outer part of the patch of inflammation; the other seen in the parenchyma, stroma, and exudation in the centre of the patch. The former, consisting of granular degeneration, atrophy, and in some cases of coagulation necrosis, must be a result of the same irritant which caused the extensive interstitial changes, and are common to all forms of severe inflammations of glandular organs. The latter, since they indicate further change in the parenchyma, coagulation necrosis and breaking down of the necrosed cells, and also since they involve the inflammatory products in the interstitial tissue themselves, must be of later occurrence and probably due to increasing quantities of toxic substances formed in the bacillary centres, possibly aided by the circulatory disturbances consequent on the occurrence of venous thrombosis. Although I have already stated the probable causal relation of the bacillus found in these necrosed areas with the morbid lesions, others have sought the cause in the pancreatic secretion itself. Thus, Sievers[23] regards obstruction to the pancreatic duct by some change in the duodenum, which leads to the retention of pancreatic juice, as the cause in his case. He supposes that the trypsin passing into the stroma of the gland and thence into the peripancreatic tissue causes necrosis of the gland tissue and then necrosis of the fatty tissue, and that this is followed by hæmorrhage. Dettmer[4] had come to a somewhat similar conclusion. He regarded multiple fat necrosis as one of the first changes occurring in retention of the pancreatic secretion and as due to the action of the lipolytic ferment. In more severe cases the trypsin might produce hyperæmia and hæmorrhage and probably partial necrosis of the gland tissue itself, which would then form a favourable nidus for the growth of various bacteria emanating from the alimentary canal. Such views are doubtless based on experiments such as those of Jung,[11] in which fat necrosis has been produced by the inoculation of fresh pancreas tissue in animals experiments which are probably dependent on the exaggerated importance which has been ascribed to fat necrosis by Balser and others. Other authors—Welch,[25] Muir,[17] Lubarsch,[14] Ponfick,[18] and Charrin and Carnot[2]—regard the condition as the product of the toxic action of some micro-organism. Among the organisms which have been cultivated and found in the pancreatic lesions, the bacillus coli communis occurred most often. In Lubarsch's case steptococci also were found.

Regarding the lesions, then, as most probably due to the toxic action

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of the bacillus coli communis, we have next to briefly consider the paths of infection and the conditions under which these are opened up.

An organ like the pancreas may become infected along three distinct channels, namely, the duct, the blood vessels, and the lymphatics.

Since Virchow and Hanau demonstrated the possibility of infection of the parotid along its duct, a similar mode of infection of the pancreas has been held by many observers. Charrin and Carnot[2] succeeded in producing pancreatitis in a dog by the injection of cultures of the bacillus pyocyaneus into Wirsung's duct. Hlava[7] produced a hæmorrhagic pancreatitis, also in a dog, by the injection of gastric juice into the duct; and other observers, finding the ducts to be the seat of considerable morbid change, and in some cases to contain organisms similar to those found in the gland lesions themselves, have all concurred in regarding Wirsung's duct as a frequent channel of infection.

In the lesions which I have described there appears to be no evidence of this mode of infection. The slight changes in the ducts, which are undoubtedly secondary, the absence of very marked changes immediately around the ducts and the distribution of the parenchymatous lesions, which are more obviously related to changes commencing in the interlobular stroma, all point to some other channel of infection.

Infection of the pancreas through the bloodvessels may occur in pyæmia, as in cases recorded by Clässen,[3] or be consecutive to a pylephlebitis, as in three cases recorded by Moore.[16] In all these cases the pancreatic lesions belonged to the suppurative type, characterised by the formation of abscesses in the interstitial tissue of the gland and retrograde changes in the parenchymatous elements in their immediate neighbourhood. In cases of acute necrotic hæmorrhage pancreatitis there seems to be no evidence which would at all indicate such a mode of infection.

The resemblance of the necrotic areas with the adjacent hæmorrhage to hæmorrhagic infarctions dependent on vascular changes has been mentioned by Leith[21] in the description of a case very similar to the present one, but in which the arteries were the seat of obliterative endarteritis. The absence of any arterial change, however, and the fact that similar necrotic lesions may be the result of the action of powerful toxic substances, would seem to be in favour of the view already expressed of the direct relationship of the bacillus coli to the inflammatory and necrotic changes.

Coming now to the last channel of infection—namely, the lymphatic spaces, I believe all the various morbid features described point to this mode of infection of the pancreas, thus in the outer parts of each patch of inflammation the most marked changes are to be found in the interstitial tissue, the parenchymatous changes being not very consider-

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able, and most marked in those cells immediately adjacent to the infiltrated stroma, there is no indication whatever of arterial disease, and the venous thrombosis is almost certainly secondary, as are also the slight changes in the ducts. On inquiring for the probable port of entrance of the causal agent, the kind of organism and the existence of well-marked morbid changes at once point to the duodenal mucous membrane. From the clinical details recorded by Dr. Reynolds, and also from the pathological evidence of the existence of comparatively old inflammatory changes in the tissue between the head of the pancreas and the duodenum, it seems beyond doubt that inflammatory disturbances have existed in this part of the intestine for some time prior to the occurrence of the fatal pancreatic lesion. But it is quite inconceivable that the acute necrotic inflammation which was found in the duodenum could have existed for any considerable period, and one is forced to regard it as a secondary condition, probably directly related to the changes in the pancreas itself. In this connection certain results obtained by Hunter[10] in a series of experiments on the action of toluylenediamin are of special interest. He found that the administration of this substance to certain animals induced considerable destruction of red blood corpuscles; and further, that the duodenum in such cases showed evidence of powerful irritation altogether out of proportion to the quantity of poison administered. He concluded then that the irritant body could not be the toluylenedianim itself, but some derivative substance (possibly one of the products of its action on the tissues), and that whatever its true nature might be, it found its way into the duodenum in the bile.

The importance of these results for our present consideration is remarkable; in both cases there is undoubted evidence of considerable blood destruction, probably of toxic origin, associated with morbid manifestations of profound irritation of the duodenal mucous membrane. The evidence of blood destruction is more complete in other cases that have been recorded. In the case recorded by Russel and Leith,[21] the blood during life contained only 1,850,000 red corpuscles per cubic millimetre, and 25 per cent of hæmoglobin; there were also numerous subcutaneous extravasations suggestive of hæmorrhagic purpura, and after death the liver was found to contain an unusually large proportion of iron; the duodenum, to the unaided eye, appeared healthy. In a case of suppurative pancreatitis recorded by Hulshizier,[9] there were ecchymoses in various parts of the body, bleeding from the gums, and the blood was found to contain 3,800,000 red corpuscles per cubic millimetre.

In such cases there appears to be considerable evidence of the existence of some powerful toxic substance leading to the destruction of red

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corpuscles, and in the present case to marked irritation of the duodenal mucous membrane, probably as a consequence of its excretion in the bile. From the clinical standpoint, Dr. Reynolds has also given ample reasons for a similar conclusion. As to the nature of the poison and its place of origin but little can be asserted, but it seems feasible to suppose that it might be some product of the extensive destruction of tissue taking place in the pancreas, as a consequence of the pathogenic activity of the bacillus coli, and that this tox-albuminous substance, finding its way into the portal blood stream, was in part excreted in the bile and in part passed on to the general circulation, where its presence gave rise to the remarkable cerebral irritation and sudden exhaustion recorded in the previous paper.

Briefly summarising the probable course of events in Dr. Reynolds' case, it seems that inflammatory disturbances in the duodenum had existed for some considerable time, gradually leading to the formation of firm adhesions between this part of the intestine and the head of the pancreas. At some short period before death the pancreas itself probably became invaded by direct extension along the lymphatics by a variety of the bacillus coli communis of special virulence which there called forth marked reactive changes culminating in thrombosis in the veins, hæmorrhages, and necrosis and disintegration of lobules of the gland, of inflammatory exudation, and of fat in the areas of infection. As a consequence of this tissue destruction certain substances were formed, possibly of the nature of tox-albumins, which, being excreted in the bile, gave rise to the intense necrotic inflammation of the duodenum, and by their presence in the general circulation produced the condition of severe intoxication characterised by remarkable cerebral excitation and sudden exhaustion.

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CHRONICLE.

Medicine.

UNDER THE CHARGE OF JULIUS DRESCHFELD, M.D., F.R.C.P.

SCHMIDT. "The composition of the fæces at the lower end of the ileum. Patient with artificial anus."—*Archiv f. Verdauungs-Krankheiter*, Bd. IV., H. 2.

THE following is a very short abstract of a long paper on a theme interesting alike to physiologists and physicians.

Miss F., æt. 22, had scarlatina at 5 years of age, rheumatism at 8, and at 18 was bedridden for some time with pulmonary catarrh. Two years before admission she began to have attacks of pain in the gastric region, and vomiting every ten days, which gradually became more frequent, till during the last seven weeks they have come on after every meal. During this latter period she has also had pain of an indefinite kind in the abdomen, but always more severe in the right side than in any other region. Motions every other day, but often requiring enemata.

When admitted to the medical wards on October 1st, 1897, she said she had lost 25lbs. in weight within a short time. Heart and lungs normal; no fever; tongue dry; abdomen moderately swollen and hard, and at various points peristaltic movements visible. Hepatic and splenic dulness normal; no special sensitiveness on palpation anywhere; no albumen. A diagnosis of chronic intestinal obstruction was made, and the patient transferred to the surgical wards.

On October 8th, after the exhibition of a purgative, there was suddenly severe vomiting at first of food, later of fæces containing many orange and cherry pips (the patient denied having eaten any such fruit for a year!). Following on this, collapse, pulse 152. Colotomy was performed, an artificial anus made, and in 36 hours the patient was wonderfully well. After this she was in perfect health, and was fed on minced meat, milk, eggs, white bread, mashed potatoes, and small quantities of light soups, coffee, and red wine. The digestion was good and patient increased in weight. There was a uniform flow of fæces through the opening. October 19th, all vegetables omitted at Schmidt's suggestion. October 22nd, and for some days after, fæces thin, then they resumed their usual thick pulpy condition. October 30th, less care in choice of food, fæces again thin, and irritated skin round the opening (tinc. catechu and tannalbin had little effect). November 6th, operation

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for repair of artificial anus, which was found to be 2—3 cm. above the ileo-cæcal valve. The valve was hard and thick, and its lumen so narrowed by the cicatricial contraction of an old ulcer that it barely admitted the tip of the little finger. Some small recent ulcers, like superficial gastric ulcers, were seen. November 7th, meteorismus, severe abdominal pain, temperature 101·3. November 9th, operation. Kink found about 10 cm. above seat of recent operation and fresh fistular opening made. December 7th, resection of 20 cm. of intestine. It was found that a swelling (Wulst) as thick as a finger projected at the seat of operation of November 6th into the lumen, and almost completely blocked it. (The nature of this swelling is not stated). From this date onwards complete recovery.

Schmidt, from October 16th to 29th, received, as far as it was possible to collect them, the whole of the fæces. Their consistence was thick pulpy. From October 25th, probably on account of less careful choice of food, the composition was less uniform, and the naked eye could detect pieces of meat, etc. The colour was light yellow to yellowish green. The smell was that of fresh bread, never that of butyric acid or putrefaction. Mucus was always absent. Microscopically, micro-organisms of various kinds, yellow coloured muscle fibre, showing the nuclei of the sarcolemma on the addition of acetic acid, isolated starch granules, cellulose with included starch granules, and Nothnagel's "ialands of hyaline mucus." (Schmidt in a reference says these are not composed of mucus). He found no mucus whatever, not even from October 25th, when the fæces were thin. The outflow of the fæces was tolerably continuous. Carmine, administered at 8 a.m., appeared in the fæces at 11 a.m., and had all disappeared at 2 p.m. The reaction was always slightly acid. Albuminoids and albumoses were present in small quantity in an aqueous extract, but sugar was never detected either by Trommer's or the phenylhydrasin test. Gmelin's test was always positive. The bile acids, hydrobilirubin, leucin, and tyrosin were never detected. Ferments acting on starch and albumin (pepsin) were proved to be present, but none acting on fat. The dried fæces contained 3·5 per cent of N., which, reckoned as albumin, gives 21·88 per cent (Rieder's correction, 15·5 per cent) of albuminoids. Ether extracted 13·3 per cent of the dried fæces. Sugar was never present, but the dried fæces contained 3·5 per cent of starch to be disposed of in the large intestine. The ash was 45·90 per cent. There is then left 33·8 per cent of the dried substance remaining, to be reckoned as the dross of the food, especially cellulose.

Analysis proved that putrefaction of albumin was practically absent, of which further proof was obtained in the defective H_2S reaction and absence of stink.

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The acid reaction was due to fermention of carbohydrates, producing formic, acetic, and butyric acids, which could not be estimated quantitatively from scarcity of material. The examination for lactic and succinic acids was omitted for the same reason.

Unfortunately gases could not be collected, although several attempts were made, so Schmidt had to be contented with a post-fermentation of 24 hours' duration. Five analyses resulted as follows :—

	Cm.	Cm.	Cm.	Cm.	Cm.
CO_2	28·8	36·8	9 1	18·0	7·3
CH_4	0·5	5·9	0·8	1 8	1·8
H_2	4·2	10·3	18·4	2·8	8·4
N_2	11·7	12·1	2·3	2·3	7·6
Air.....	1·0	1·0	4·8	3·4	0·0
	46·2	66·1	35·4	28·3	25·1

Deducting the air the percentage composition was :—

	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
CO_2	63·7	56·5	29·7	72·3	28·1
CH_4	1·1	9·1	2·6	7·3	7·2
H_2.....	9·3	15·8	60·2	11·2	33·4
N_2.....	25·9	18·6	7·3	9·2	30·3

Looking on the N_2 as a residuum of air—as is most probable—and not a product of fermentation, the gases are really composed of CO_2 and H_2 in varying proportions, and a small quantity of CH_4 (methan).

Summed up the results are :—

(1) Remains of food: Muscle abundant, connective tissue scarce; small quantities of dissolved albuminoids; fatty substances; undigested cellulose containing starch granules; free starch granules.

(2) Products of digestion: Albumoses; no leucin, tyrosin, nor sugar.

(3) Glandular secretions; pepsin; diastatic ferment, no fat-splitting ferment; unchanged bile colouring matter; no bile acids; no mucus.

(4) Bacterial products; traces of aromatic oxy-acids; formic acid, acetic acid, butyric acid: CO_2, H_2, CH_4.

Macfadyen, Nencki, and Sieber found from 0·3 to 4·75 per cent of sugar in their case; Jakowski 1·65 to 2·32 per cent in his case. These differences are not pathological but physiological, and are peculiar to the individual. The same holds good of the amount of dissolved albumen found—Macfadyen, Nencki, and Sieber, 1 per cent; Schmidt, a trace; and of the bile acids, Jakowski, undoubted traces; Schmidt, none.

The ferments present in the small intestine continue their work in the colon, the stay of food in the former being three to six hours, in the latter ten hours. The function of the mucous membrane of the colon is absorption; its secretions (mucus, fats, salts) are excretions, and worth-

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less for digestion. Little fat passes into the colon; it is almost wholly digested and absorbed in the small intestine.

Under normal conditions indol, phenol, scatol, and H_2S are almost completely absent above the ileo-cæcal valve. The decrease of ethereal sulphates after the administration of drastic purgatives is due to the rapid passage of the intestinal contents through the colon. Indol, phenol, etc., in any quantity in the small intestine are pathological, and are due to a hindrance in the passage of its contents, as in peritonitis and inflammations, etc., near the ileo-cæcal valve. Our knowledge of the factors is obscure, but disturbances of motor activity play an important part.

"What circumstances normally prevent putrefaction in the small intestine, and how is it that it suddenly sets in below the valve?" No satisfactory answer to this question can be given. The supposed inhibitory action of the carbo-hydrates is insufficient, as there can be little difference in the amount of these above and below the valve. Next, what causes the difference in the flora above and below the valve, the bacteria of the former being chiefly those of fermentation, of the latter those chiefly of putrefaction, and what inhibits the action of the putrefactive bacteria present in the small intestine? The character of the food is of primary, the flora of secondary, importance. Finally, the speed at which the intestinal contents move is of importance. The speed in the large intestine is only about $\frac{1}{25}$ of that in the small intestine. This alone is not sufficient, but it stands first, followed by absorption of the dissolved carbohydrates, thickening of the chyme, and loss of the acid reaction. *James Gardner.*

Thomas (John D.). "Hæmoptysis, with a report on the use of atropin hypodermically in its treatment."—*Philadelphian Medical Journal*, Vol. II., No. 3, p. 7, 1898.

The author considers first the etiology of hæmoptysis.

(1) In a small percentage of cases there is no apparent cause. Ware reports 386 cases, of which 62 were of this character (a much larger proportion than is noted by other observers, such as Osler).

(2) In by far the largest proportion of cases the hæmorrhage is caused by pulmonary tuberculosis in one of its stages. According to Sir Douglas Powell, the hæmorrhage in fatal cases almost invariably comes from rupture of a branch of the pulmonary artery in a cavity.

(3) In elderly people hæmoptysis may occur in patients having a rheumatic history (Sir Andrew Clarke).

(4) Hæmoptysis is very rare in children under 10 years. Cumston records a fatal case in a child only sixteen months old, caused by the

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opening of a branch of the pulmonary artery into a tuberculous cavity. It may occur in children suffering from gangrene of the lungs.

(5) Hæmoptysis occurs in cases of severe heart disease.

(6) Vicarious menstruation is a rare case of hæmoptysis, and in many of these cases there is a predisposition to tuberculosis, or actual tuberculosis, without any physical signs.

(7) Any disease causing degeneration of the lung tissue, such as abscess, gangrene, carcinoma, syphilis, chronic pneumonia.

(8) Rupture of an aneurism.

(9) Diminished atmospheric pressure, as in mountain climbing, balloon ascensions, etc. This only occurs if the lungs are perfectly healthy.

(10) Hæmatodyscrasiæ, as in bæmophilia, scurvy, and purpuric diseases.

(11) Asthma has also been given as a cause.

(12) Injuries direct or otherwise.

(13) Injury to certain parts of the brain; nervous affections (R. Maguire).

[The author does not mention hæmoptysis due to the hæmorrhage from the upper air-passages, due to growths, chronic inflammation, cirrhosis of the liver, etc.].

After briefly considering the differential diagnosis and results, both immediate and remote) of hæmoptysis, the author discusses the treatment. Drugs to cause coagulation of the blood, gallic acid, and other astringents, calcium chloride (Wright), and such which cause diminution in the amount and retardation of the flow of blood at the bleeding point, so that coagulation will take place.

Atropin in doses of $\frac{1}{60} - \frac{1}{15}$ grain has been successfully tried in some severe cases by Loble (*Med. Record*, 1892), Hausmann, of Meran (*Med. Record*, Vol. XXXII, 1887), R. A. Stirling (*Med. Record*, Vol. XXXV), who report cases where profuse hæmoptysis, which did not yield to any treatment, quickly stopped on the subcutaneous application of atropin. The application has to be repeated after a few hours. To these cases the author adds a brief account of seven more.

Case 1.—A man, æt. 20, with profuse hæmoptysis; family history of tuberculosis. Profuse hæmorrhage had continued in spite of all treatment for two days, and was promptly checked by $\frac{1}{200}$ grain of atropin, given hypodermically, and repeated every two hours for one day.

Case 2.—A man, æt. 21, profuse hæmoptysis. Atropin was given, but patient died from hæmorrhage, causing suffocation.

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Case 3.—A man, æt. 35, had severe hæmorrhage, which was checked by injection of $\frac{1}{100}$ grain of atropin, and when another hæmorrhage occurred $\frac{1}{50}$ grain was injected, which stopped the hæmorrhage finally.

Case 4.—Case of profuse hæmorrhage, which ceased four minutes after injection of $\frac{1}{50}$ grain of atropin.

Case 5.—Man, æt. 45, ended fatally, like Case 2.

Case 6.—This was a case of valvular heart disease, hæmoptysis controlled by $\frac{1}{50}$ grain of atropin.

Case 7.—Female, æt. 28, case of tuberculosis, with profuse hæmoptysis; hæmorrhage arrested by atropin.

The author speaks also well of venesection in some cases, and of nitro-glycerine.

KOVALEVSKY (P. T.). "Die Arteriensklerose des Gehirns (arterio-sclerosis of the brain)."—*Neurol. Centralblatt*, No. 15, 1898, p. 674.

ARTERIO-SCLEROSIS, or atheroma of the arteries of the brain, has up to now been little studied as the cause of certain definite brain symptoms.

Grasset ("Du vertige cardio-vasculaire ou vertige des artério scléreux," 1890), when speaking of chronic vertigo, recognises certain forms—the epileptic form, the sensorial form or Menière's disease, the digestive form, and the cardio-vascular form or the vertigo due to arterio-sclerosis. The vertigo in the latter form is either a simple vertigo, or the vertigo accompanied by epileptiform fainting attacks. One of Grasset's patients had a pulse of 25—30 per minute, and, when the pulse became still slower, the patient had an attack of syncope. According to Grasset, the symptoms are caused by arterio-sclerosis of the vessels of the medulla oblongata.

Mendel ("Über den Schwindel," *Berlin klin. Wochensch.*, 1895) also looks upon vertigo as an early sign of arterio-sclerosis, and recommends prolonged use of iodide of potassium and ergotin.

Regis ("Neurasthenie et artério-sclérose," *Presse méd.*, 1896) draws attention to the frequent occurrence of neurasthenia in arterio-sclerotic patients, even at a time when there is as yet no very marked arterio-sclerosis, noises in the ear, vertigo, disturbances of the vascular system, and bladder troubles being the most prominent symptoms. Probably both the neurasthenia and arterio-sclerosis are in these case dne to the same cause, namely, to the disturbances in the nutrition.

Hutchings (*State Hospitals Bulletin*, 1896) looks upon the nervous symptoms noticed in arterio-sclerosis as due to disturbance in the nutrition of the ganglia-cells, caused by the thickening of the walls of the blood-vessels; hence the prominent symptoms are diminution of the mental activity, vertigo, attacks of syncope, and disturbances of speech.

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To recognise the early stage of arterio-sclerosis the aorta and the eyes should be carefully examined.

Lapinski (*Wratsch*, 1896) examined the large vessels of the base of the brain, and also the capillaries, and found the capillaries often affected with cloudy or granular degeneration.

Beyer (*Centralb. f. Nervenheilk.*, 1896) describes some cases of arterio-sclerosis which resembled general paralysis. The disease occurs between the ages 50—55, and commences with an attack of apoplexy, hence he calls it dementia apoplectia, and it differs from general paralysis by the attacks of dementia occurring at separate stages.

Arnaud (*Gaz. hebdom.*, 1897) draws special attention to the similarity of the symptoms of arterio-sclerosis and general paralysis.

The author gives three cases of his own :—

Case 1.—P., æt. 70. Eighteen months before the author saw him he complained of loss of memory, vertigo (occurring in paroxysms and lasting only a few minutes), staggering gait, tinnitus aurium, and constipation. Nine months after the commencement of the disease the symptoms got worse; sleep was much disturbed; when the patient awoke in the morning he saw everything through a fog; he had a good deal of præcordial oppression, the attack of vertigo became worse and was accompanied by attacks of syncope. The patient, who appeared strong and muscular, showed slight tremor of the tongue, speech somewhat indistinct; temporal arteries showed arterio-sclerosis; the ophthalmoscopic examination showed tortuous retinal arteries; left ventricle slightly dilated, accentuation of the second sound, pulse 40—50 per minute; the tendon reflexes diminished, pupils normal. The patient was ordered iodides, cardiac tonics, cauterisation of the spine in the cervical region, laxatives, and strict diet and recumbent posture. In the course of a month the patient improved very much. Carbonate of soda and lactic acid, which were tried in the second month of the treatment, had no effect, the treatment with iodides was again commenced, and the patient considerably improved and considered himself fit for work.

Case 2.—Male patient, æt. 67. A neurotic family history. Patient had syphilis 35 years ago; had influenza four years ago; soon after suffered from attacks of vertigo lasting 20—25 minutes, accompanied by fainting. He also suffered from tinnitus aurium, loss of memory, sleeplessness, and præcordial oppression. Eight months after had an apoplectic seizure, with loss of consciousness, followed by right-sided paresis and aphasia, which disappeared after four days. Two months after had a second apoplectic attack, not followed by paralytic symptoms. Patient appeared strong and muscular; right pupil smaller than the left, both react promptly; marked arterio-sclerosis, tortuous retinal

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arteries, dilatation of left auricle (?), accentuation of second sound; pulse 56—60, reflexes increased.

Case 3.—Female, æt. 62. Her mother was a very nervous woman; one of her sons and one of her daughters suffer from megrim. The patient was an excessive smoker. Twelve years ago she suffered from an attack of pain in the lower extremities, which became covered with red blotches. These attacks persisted for three years, and then ceased. For the last four years patient has suffered from noises in the ear, vertigo, sleeplessness, and failure of memory. Two years ago she began to suffer from more severe attacks, commencing with twitchings of the face, fainting sensation, and a feeling as if everything was moving around her. The attacks lasted from one to three hours, and terminated with vomitings. During the attack the patient heard well, and understood all that was said to her, but could not answer. After the attack she felt very faint. During the last twelve months the attacks occurred more frequently. The patient showed marked arterio-sclerosis, seen also in the retinal arteries; left ventricle enlarged; pulse, 60. Cardiac tonics and sodium preparations caused marked improvement in her condition.

The author believes that some of the symptoms common to these cases, such as vertigo, sleeplessness, syncopic attacks, failure of memory, are due to the atheromatous process in the arteries generally, whilst a second group—failure of mental power, disturbance of speech, apoplectform attacks, staggering gait—of symptoms depends on the locality affected.

As regards treatment the author has tried the treatment recommended by Rumpf (*Berl. klin. Wochensch.*, 1897), who, considering that in arterio-sclerosis salts of lime are deposited in the altered wall of the vessel, recommends (1) to diminish the quantity of lime salts taken with food, and (2) to try and decalcify the arteries. He, therefore, recommends a diet which does not contain milk. The diet should consist of meat, 250 grammes; potatoes, 100 grammes; bread, 100 grammes; fruit, 100 grammes; fish, 100 grammes; along with butter and sugar, and instead of fruit the patient may take vegetables. Besides the abstension from milk, the patient is not allowed to eat cheese, eggs, rice, spinach. The diet Rumpf recommends contains ten times less lime salts than milk diet. Distilled or boiled water only are allowed as bèverage. To increase the elimination of lime salts Rumpf recommends lactic acid (sodæ bicarbonatis 10 grammes, acid lactici q. s. ad saturat. aq. destill. 200 grammes). A similar effect may be produced by calomel, acetate of potash, oxalic acid, and many diuretics. The author has tried Rumpf's method in several cases without much benefit.

J. Dreschfeld.

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Surgery.

UNDER THE CHARGE OF THOMAS JONES, M.B., B.S. F.R.C.S.

KUMMER (E.). "La fracture de l'astragale."—*Revue Médicale de la Suisse Romande*, July 20, 1898.

FEW authors have devoted special attention to the etiology and mechanism of fractures of the astragalus. The writer of this paper has been able to collect only about ninety cases from medical literature. The X-rays, however, show that the astragalus is much more frequently broken than is usually supposed.

Pathological Anatomy.—The following varieties of fracture may occur:—(1) Fracture of the neck: This is much the most frequent. Either the body or the head of the bone may be displaced, more often the body. Not infrequently the injury is accompanied by fracture of the malleoli, the tibia, or the calcaneum. (2) Horizontal fracture: Seven cases, five of which were verified by inspection of the bone, have been recorded. (3) Sagittal fracture: Three cases have been published. (4) Oblique fracture: Three cases. (5) Comminuted fracture: Seven cases. (6) Fracture of the posterior apophysis: This piece of bone is ossified from a separate centre (os trigonum); it has been separated in six instances.

Etiology.—The fracture has occurred most frequently from a fall upon the feet. In a smaller proportion of cases it has resulted from direct violence.

Mechanism.—The comparative frequency of fracture of the neck of the bone is explained by this being the most constricted part. Further, this part of the bone has a more open texture, as is shown by the comparatively feeble resistance which it offers to the passage of the X-rays. The author also attributes considerable importance to the angle which is formed between the head and the body of the bone. He gives an account of certain experiments which he has made, with the object of determining the mechanism of these fractures.

Symptoms.—Impairment of the functions of the articulations of the astragalus, with a certain degree of hæmarthrosis, will be present. Crepitus can seldom be obtained. In many cases the broken bone can be examined through a wound of the skin.

Prognosis.—Consecutive troubles may affect the bone itself or the tibio-tarsal articulation. The danger of necrosis of the fragments has

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been exaggerated by Malgaigne and other writers. In certain cases ankylosis or chronic arthritis of the ankle-joint has been set up. Wound-infection in compound fractures may endanger the life of the patient.

Treatment.—Immobilisation with the foot flexed to a right angle, associated after the first few days with massage and gentle passive movement, should be the treatment adopted. When a fragment of bone cannot be replaced, it should be removed, either by a primary or a secondary operation. In fracture of the neck of the bone, with irreducible displacement, the removal, either of the head or of the body of the bone, has given good results. In fracture of the apophysis, one should attempt to secure bony union; failing this, the apophysis may be removed. The results of resection of the whole bone in old-standing cases, with malposition of the foot or ankylosis of the ankle-joint, have been very satisfactory.

HASSLER. "Contribution au traitement des fractures de la clavicule."—*Lyon Médical*, January 12 and 19, 1896.

THE author records in detail two cases—(1) Fracture of the left clavicle at the junction of the middle and outer thirds; treatment by early massage; very rapid consolidation. (2) Fracture of the right clavicle in the middle third; treatment by immobilisation and the "classical" apparatus; compression and neuritis of the brachial plexus; osteotomy and double silk suture; union by first intention; cure.

In considering the question of treatment, he says it is important to find out whether the fracture has been caused by direct or indirect violence. Three methods of treatment may be employed—(1) Absolute immobilisation by fixed apparatus; (2) early massage and relative immobilisation; (3) primary suture of the bone.

Absolute immobilisation, he says, should be abandoned—(*a*) Because it cannot be realised by any simple apparatus; (*b*) because it leads to muscular atrophy, more or less considerable; (*c*) because, as Championnière has shown, and as he has seen in his own experience, it is unnecessary for consolidation.

Early massage and relative immobilisation is applicable to almost all cases of fracture by indirect violence and to the great majority of those caused by direct violence.

Primary suture of the bone may be necessary—(1) In cases of fracture with considerable overlapping of the fragments and irreducible displacement; (2) in young persons where it is necessary to avoid any permanent deformity; (3) in many cases of fracture of the middle third of the bone, caused by direct violence and accompanied by injury to the

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vessels or nerves; (4) when a fragment has been forcibly depressed and cannot be maintained in position; (5) when a fibrous or muscular band is interposed between the fragments; (6) in compound fractures of the bone. Secondary suture of the bone may be necessary on account of complications resulting from exuberant callus or vicious union.

Details of the methods of treatment by massage and by suture are given.

POWELL (ARTHUR). "Liver abscess: A plea for more accurate diagnosis and localisation by exploratory laparotomy; cases; round worms found in an abscess."—*Indian Medical Gazette*, February, 1898.

HATCH (W. K.). "Cases of hepatic abscess of special interest.—*Ibid.*

POWELL says that it must have fallen to the lot of most surgeons of large Indian experience to have explored the liver for pus with the aspirator, in vain at the first attempt, and yet at a subsequent aspiration, or perhaps post-mortem examination, an abscess has been found in a position which must have been traversed at the previous exploration. He therefore considers that attempts at aspiration should be abandoned, and that the more surgical proceeding of abdominal exploration should be adopted. Aspiration, apart from its uncertainty, is not altogether free from danger; fatal hæmorrhage has occurred, and not unfrequently it has been the direct cause of suppuration. In two cases he used a vertical incision, but in future he will use a transverse one, as suggested by Mr. Mitchell Banks. He records a number of interesting cases, including one in which the hepatic abscess was so large that it was at first diagnosed as ascites, and another in which two round worms, which had apparently entered through the bile ducts, were found in the cavity.

Hatch gives details of four cases of hepatic abscesses. He states that he has, on several occasions, when aspirating hepatic abscesses, found that if the needle enters the upper part of the cavity a clear yellow fluid is withdrawn, as if the thicker part of the contents had sunk to the bottom, leaving a serous layer above.

CARTLEDGE (A. MORGAN). "Cholelithiasis, with report of cases."—*Medical News*, February 19, 1898.

ELSNER (HENRY L.). "The vagaries and wanderings of gall-stones, with clinical reports."—*Medical News*, February 5, 1898.

CARTLEDGE, after a brief reference to the symptomatology of these cases, gives a detailed account of fourteen patients who were subjected to operation. In thirteen of the cases the gall-stones occupied the gall-

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bladder or cystic duct, or both. In one case the common duct was the seat of obstruction. All the operations, with one exception, were successful. The only case which presented very special features was one in which the liver was firmly bound down by adhesions to the transverse colon and other parts, and in which there was an abscess on its under surface. This could only be reached by incising the liver-substance. Subsequently a large gall-stone, two inches in diameter, was removed from the abscess-cavity. The author says he has been unable to find a record of any similar case in which a gall-stone has been removed through the substance of the liver.

Elsner records six interesting cases of gall-stones. Case 1 was a woman, aged 57, who had a large gall-stone which had escaped by a process of ulceration into the duodenum. During its passage down the intestine it was temporarily arrested at various points, giving rise to symptoms of obstruction. For a long time this case closely simulated one of pyloric cancer.

Case 2 was one of cholecystotomy, in which the gall-bladder was distended with pus, and contained a large stone. At a subsequent operation it was found that there was cicatricial contraction at the point of entrance of the common bile-duct into the duodenum. A fresh opening was made into the duodenum, and an anastomosis established between the common duct and the intestine. The patient made an uninterrupted recovery.

In Case 3, post-mortem examination showed that a gall-stone had ulcerated out of the cystic duct into the retro-peritoneal space, and had lodged in the connective tissue behind the pancreas.

Case 4 showed a fistulous track leading from the gall-bladder into an abscess-cavity the size of an orange, and thence into the pelvis of the kidney, in which an enormous cholesterin stone was present.

Case 5 showed three stones closely packed in the common duct, the mucous membrane of which was ulcerated, and the duct itself greatly distended.

In Case 6 the gall-bladder contained 601 small, pyramidal, hard, white stones.

Ferguson (A. H.). "Remarks on choledocho-lithotomy, with a report of five cases."—*Medicine*, August, 1897.

After recording in detail his five cases, the author draws the following conclusions: (1) For the treatment of stone in the common duct, whether impacted or loose, which cannot be extracted through the cystic duct and gall-bladder, choledocho-lithotomy is the ideal surgical procedure. In breaking up the stone with needles or forceps, it is

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uncertain that complete work is done; the débris may not all escape with the bile, and more or less injury may be done to the walls of the duct. (2) Cutting into the duct longitudinally does not appear to predispose to complications or sequelæ. (3) In most cases of obstruction of the common duct by gall-stones, there are also stones in the cystic duct and gall-bladder. Under these circumstances, cholecystotomy should be the operation of choice; because (*a*) it is usually easy to remove stones from the common duct through the dilated cystic duct; (*b*) the safety of the patient from death by cholæmia is insured, and the patient may not be able to endure any more severe procedure; and (*c*) should a stone be left in the common duct, it can be treated by bougies or by choledocho-lithotomy in preference to cholecyst-enterostomy. A short account of the symptoms of obstruction of the common duct and of the technique of the operation is given.

HALSTED (W. S.). "Minature hammers and the suture of the bile-ducts."—*Philadelphia Medical Journal*, April 2, 1898.

SUTURE of the bile-ducts after removal of a stone is very difficult on account of the thin walls and the small size of the channel. To overcome this difficulty, Halsted has devised a series of small hammers of various sizes, which greatly facilitate the introduction of the sutures. The handle of the hammer is made of flexible aluminium, and is attached near one end of the head, since this facilitates its introduction into the duct. Before incising the duct, two stitches are introduced into it to serve as retractors; the duct is then opened and the stone removed, and a hammer of suitable size is introduced. As many mattress stitches are introduced as are necessary to close the opening, the hammer being removed before they are tied.

The advantages claimed for the hammer are—(1) The duct to be sutured can be drawn towards the incision in the abdominal wall; (2) the duct is gently expanded by the hammer; (3) the hammer prevents escape of bile during the process of suturing; (4) wounds of thin-walled normal ducts can be easily sutured.

Halsted has used the hammers seven times—five times in operations upon dogs and twice in the human subject.

Illustrations of the hammer and the method of using it are given.

J. E. Platt.

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Midwifery and Diseases of Women.

UNDER THE CHARGE OF W. J. SINCLAIR, M.A., M.D.

LEOPOLD and HAAKE: Dresden. "On one hundred cases of Cæsarean sections."—*Archiv für Gynäk.*, Vol. LVI., Part 1.

THIS is an interesting and important contribution to obstetric practice. Whether or not it helps greatly in defining the indications for Cæsarean section and symphyseotomy, respectively, if that can ever be more than approximately done, it must greatly assist and encourage obstetric practitioners who may be in a position to perform Cæsarean section and are opposed to the practice of first destroying a living child, and then subjecting the mother to an operation almost or altogether as dangerous as the conservative Cæsarean section. A fact which adds much to the importance of this report is that Leopold has had an unrivalled experience in the various forms of this operation and of its alternatives. The total of one hundred operations which form the subject of the report were performed in a little more than 14 years, the most of them at the Royal Hospital for Women at Dresden. The first 50 cases have been already reported: the remaining 50 appear to be published for the first time in the contribution under consideration.

The 100 operations are divided into two classes—(1) Conservative Cæsarean section, 71; (2) mutilating or Porro operations, 29.

The 99 Cæsarean operations performed at Dresden correspond to 22,358 confinements, which is a proportion of 1 : 225. Analysed, the figures give for the conservative operation the proportion of 1 : 319, and for Porro's operation 1 : 771.

One point which is worthy of notice is, that the first series of operations extended over nine years, whereas the second series of 50 were performed in the course of five years. This is obviously the result of experience and improved technique, which gave confidence and led to extension of the relative indications for the operation. Leopold is decidedly of opinion that there may be relative indications for the operation which save us the painful necessity of perforating the head of a living child. But the conditions under which the operation may be done must include the means of obtaining the most rigorous asepsis. Hence he thinks that the operation should not be performed except in a properly equipped institution.

Indications for Cæsarean Operation in Cases of Contracted Pelvis. The indication is either absolute or relative.

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(1) *Absolute Indication.*—At the Dresden Women's Hospital the absolute indication for the Cæsarean operation is a true conjugate of less than 6cm. Zweifel considers a true conjugate of 6cm. an absolute indication. Yet, though the term absolute is used, there is really little absolute in practice, as the operation may be as surely indicated with a true conjugate of 6·5cm. and a large fœtus as with a true conjugate of 5·5cm. and a small fœtus. An examination of the cases also shows that among the indications, besides the length of the true conjugate, were tumours obstructing the genital canal, osteomalacic deformities, rupture of the uterus, etc.

(2) *Relative Indication.*—It is difficult to state in an exact numerical form the superior limit of relative indication for the Cæsarean operation. We have to consider other possible proceedings, among which is version followed by immediate extraction. At the Dresden Hospital it has been decided, on account of the good results obtained, to fix on 7cm. of a true conjugate as the inferior limit for version followed by immediate extraction. This only applies to flattened rachitic pelvis. In flat rachitic and generally contracted pelvis the inferior limit is 7·5cm. Hence, in contracted pelvis, the limits of relative indication, if the measurement of the true conjugate alone were considered, would vary between 5cm. and 7·5cm. But here still more, perhaps, than in the estimation of the absolute indication the decision of the surgeon ought not to depend upon a fraction of a centimetre. Other circumstances, such as the size of the fœtus, for example, ought to be taken into consideration.

Of the 100 operations, 93 were performed upon women with contracted pelvis. According to the type and form of the pelvis, the cases are subdivided as follows: (1) 7 generally contracted; (2) 11 flat, rachitic; (3) 65 flat, rachitic, and generally contracted; (4) 2 flat, rachitic, and obliquely contracted; (5) 4 kyphotic and generally contracted; (6) 2 generally and obliquely contracted; (7) 1 osteomalacic; (8) 1 generally contracted, pseudo-osteomalacic.

According to the degree of contraction, the pelves may be divided into three groups:—

(1)	With a true conjugate of from 8·5 to 7	39
(2)	„ „ „ 7 to 6	35
(3)	Contraction to absolute indication	19

Indications for Porro's Operation.—The author's remark to begin with on this head, is that it is impossible to lay down systematic rules which the operator must blindly follow. It is necessary to weigh the facts of each individual case. It may be set down as a general rule, however, that Porro's operation should be done when certain conditions essential

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to the successful application of the conservative method are not fulfilled in any given case. The conditions are: (1) That the woman in labour has energetic contractions of the uterus; (2) that her general health has not been enfeebled by any serious malady; (3) that it is certain that the patient has not become infected by the time of the operation. It is important also that there should be no elevation of the temperature or marked acceleration of the pulse. It is also extremely desirable that the membranes remain intact till the beginning of the operation, or at least have ruptured only a short time before the operation. It is of the first importance that the patient has been subject but little to examination, and that only by persons beyond suspicion of conveying infection. Moreover, it cannot be too strongly stated that the conservative operation must not be performed upon a woman who is the subject of gonorrhœal infection, whether acute or latent. This disease produces such unfavourable results in the puerperium that it is imperatively necessary to ascertain, in every case for operation, whether or not it exists; and in order to do so, an examination must be made not only of the urethro-vaginal secretions, but also of those of the cervix uteri. When positive proof of its presence has been obtained, it is better to resort to Porro's operation or even to perforation.

Keeping these general indications in view, the authors resorted to Porro's operation in the following classes of cases: (1) In 4, because the patient was already infected; (2) in 9, because it was resolved to induce sterility by reason of considerable contraction of the pelvis in patients of dwarfish stature with rachitic deformities; (3) in 2 cases of considerable contraction with grave constitutional anæmia; in 2 others, because of serious cardiac lesions without compensation; in 1 case the contra-indication to the conservative operation was a nephritis which would have rendered the patient more liable to secondary hæmorrhage and to infection; (4) in 5 cases it was necessary to abandon the conservative operation in favour of Porro's, on account of atony of the uterus; in these cases it was not only the fear of bleeding which led to the adoption of utero-ovarian amputation, but the clinical experience that women who have lost much blood are more liable than others to thromboses, embolism, and especially to septic processes; (5) in 4 cases on account of tumours of the uterus or of the ovary, three of which tumours were malignant; (6) in one case of osteomalacia, in one case pseudo-osteomalacia, in one case complete hernia of the uterus with considerable relaxation of the abdominal walls and of the ligaments; (7) in 2 cases complete rupture of the uterus.

Among the patients, whose ages ranged from 19 to 49, there were 40 primiparæ and 60 multiparæ. The number of multiparæ is remarkably large, and the explanation of the adoption of the Cæsarean operation is

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of much interest. Of the 60 multiparæ, 55 were subjected to the operation on account of pelvic contractions. These 55 multiparæ had before the Cæsarean section a total of 108 labours. These labours may be grouped according to their method of termination in the following way:—

(1) Spontaneous completion at term,	15;	children living,	15;	dead,	5
(2) Premature labour.....	7;	„	„	2;	„	5
(3) Abortions	9;	„	„	0;	„	9
(4) Requiring operation..... ..	77;	„	„	25;	„	42
	108			37		61

The result of the 108 pregnancies gave thus a total of 37 living children. But attention is called to the fact that out of 25 children born alive after operative interference, 14 owed their lives to Cæsarean section alone, while the other operations—version with extraction, forceps, etc.—saved only 11 children out of 67, giving a fœtal mortality of 83·6 per cent.

In the 100 cases Cæsarean section had been performed more than once on 13 of the patients—four times on one, three times on another, twice on eleven.

Method of Operation and Assistants.—Under this head the authors touch only on some points in the method of operation, which are still under discussion.

(1) *The Employment of the Elastic Band.*—At Dresden the elastic band round the neck of the uterus is employed in most cases as a means of preventing hæmorrhage. If it is not put on too tightly and not permitted to remain long in position, its use is not accompanied by any drawbacks. Leopold himself always uses the elastic band, so as to familiarise his students with it, because they (the future practitioners) may have to perform the operation under difficulties which are unknown to the staff of a well-appointed hospital. With the assistance available in the hospital the hæmorrhage could be controlled and the suturing of the uterus carefully completed under digital compression alone.

(2) *Suture Material.*—Silk sutures were generally employed, and quite successfully. In only 1 case in the last series of 50 was a sinus produced by the sutures followed by extrusion of the thread after suppuration.

(3) *Method of Suturing.*—From 12 to 15 deep sutures are introduced. The thread is introduced about one-third of an inch from the margin of the peritoneum, and it is passed in a curve so as to include a portion of the muscular tissue, and emerge just at the border of the internal wound. The superficial sutures are usually 13 to 17. They seize only the peritoneum and a superficial layer of muscular tissue.

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(4) *Precautions against Hæmorrhage.*—Hypodermic injections of ergotin are used. One is given before the anæsthetic is administered, and a second just when the patient is put upon the operating table.

(5) *Assistants.*—Three at least are required; one to administer the anæsthetic, who should be experienced at his work, as regular anæsthesia is essential to success; an operating assistant, who should be familiar with all the details of the operation; and it is well to have a third to attend to the child if it should be asphyxiated when extracted.

RESULTS.

Maternal Mortality.—There were 10 deaths among the 100 women operated upon. That is exactly a mortality of 10 per cent.

There were seven fatal results among the 71 cases of conservative Cæsarean section, equal to a mortality of 9·8 per cent, and three among the 29 cases of Porro's operation, that is, a mortality of 10·3 per cent, so that the mortality from the two forms of operation was almost exactly equal. It is satisfactory to learn, in reference to the mortality, that there is no selecting of cases with a view to obtaining good "statistics." The operation was undertaken in the most serious and complicated cases with the single object of saving the lives of the patients and the children. The gross mortality of 9·8 per cent for the conservative operation would fall to 5·8 per cent if three cases were excluded in which the death was due to other causes than the operative proceedings. One death was owing to infection before operation, another to œdema of the lungs produced by the anæsthetic, and the third to gonorrhœal infection in a rather acute stage. Why the conservative operation was performed in two of these cases, contrary to the rules laid down in a previous part of the report, is not very clear.

Two of the patients who underwent Porro's operation died from causes not attributable to the operation. One was in a cachetic condition owing to medullary sarcoma of the right ovary, and one was operated upon when half moribund from disease of the heart, with general anasarca and albuminuria. If all these cases be eliminated, the mortality of the operation upon tolerably healthy women falls to 5·2 per cent.

Fœtal Mortality.—All the children extracted by the conservative operation were alive, that is, 71, or 100 per cent. Looking at the operation purely from the standpoint of obstetrics, it hardly concerns us to know how many of the children died before the mothers left the hospital, and how many of them were the victims of intestinal catarrh or bad nursing

Owing to the facts of the Porro operations, only 25 have to be considered in reference to fœtal mortality. Two of the children were lost during the operation, giving a mortality of 8 per cent.

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The Puerperium.—In 51 cases the condition after operation was absolutely apyretic, the temperature never rising above 100° Fahr. In 13 cases there were slight elevations of temperature beyond 100·4, which is considered not abnormal. In 13 cases a certain amount of fever due to septic processes was observed.

In several others more serious conditions were observed. In 4 there was thrombosis; in 5 rather serious bronchitis. In addition to these there was one case of each of the following complications: Mastitis, nephritis, cystitis, eclampsia, gonorrhœal arthritis, and psychosis.

In concluding, the authors proceed to compare the results of symphyseotomy as obtained by Morisani, Zweifel, Pinard, and others, with the results of the Cæsarean section. Details are hardly relevant to the purpose of this summary, but it may be stated that both the gross and the "analysed" mortality come out somewhat in favour of the Cæsarean operation. *W. J. Sinclair.*

Smith (A. Lapthorn). "The best operation for the cure of displacements of the uterus."

The conclusions to which the author had come in his paper were based—(1) Upon his own personal experience of 111 ventrofixations and 89 Alexander operations; (2) upon the experience of 40 first-class operators, all fellows of the American Gynecological Society, who had had among them about 2,500 ventrofixations or suspensions of the uterus; and (3) upon his recent visit to the leading gynecologists of Europe, whom he had seen performing vaginal fixation. His own experience with Alexander's operation was all that could be desired; no difficulty in finding the ligaments, no hernia, only one relapse, and no trouble in subsequent labours. With ventrofixation the cases had been much more serious because he had only done it when there were diseased tubes causing fixation of the uterus; one patient had died, one had relapsed, one had a hernia, two had miscarried, and three had had normal labours; in seven cases a buried stitch had required removal subsequently. Out of the cases reported by other operators above mentioned there had been 146 pregnancies, in 36 of which there had been pain, miscarriages, or difficult labour requiring obstetrical operation, and two of these women had died. Most of these operators had abandoned fixation, and now performed suspension by stitching round ligaments to abdominal wall. As a result, however, of what he had recently seen on the Continent, he would now abandon both Alexander's operation and ventrofixation and ventrosuspension, and treat all these cases in future by vaginal shortening of the round muscles, which had the following advantages:—(1) It is very easy;

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(2) it can be done very quickly; (3) it should have no mortality; (4) it is free from subsequent pain; (5) it will do as well for cases of retroversion with fixation as for those in which the uterus is freely movable; (6) it does not interfere at all with subsequent labour or pregnancy; and (7) it does not leave any painful wound or unsightly scar, women being more willing to have an operation in the vagina than in the abdomen.

SMITH (A. LAPTHORN). "Pregnancy following ventrofixation, with improvements in the technique of the operation."—*American Journal of Obstetrics*, July, 1898.

VENTROFIXATION is the best and only method of curing retroversion of the uterus when that organ is bound down by adhesions. Pessaries are out of the question, owing to the pain and discomfort they cause. Alexander's operation fails in such cases, and in performing it the round ligaments have been pulled out of the uterus in several cases. Even if they are not torn the steady pull of the adhesions backward will overcome that of the ligaments forward, and as a result they will either relax or tear out of their anchorage, or will be subject to a constant and eventually painful strain.

The writer advises operation in retroversion of the uterus, not only because it relieves the reflex nervous symptoms, but because he believes that the pressure of the fundus on the rectum sometimes leads to ulceration and contraction of the intestine.

Technique.—This consists in scarifying both uterine and abdominal peritoneum, and stitching the top of the anterior surface of the fundus to the abdominal peritoneum, and not including anything else, with two silk ligatures. To guard against this parietal peritoneum being peeled off by the weight of the uterus, it is supported for a month by passing through it the silkworm-gut sutures which close the abdomen.

What part of the fundus should be attached to the abdominal wall? As free movement of the uterus must be allowed so as to permit it rising as the bladder fills, and falling as it empties, and considering the possibilities of pregnancy, the author advises that an area of half a square inch of the top of the fundus should be attached. To attach the whole of the anterior surface of the body of the uterus to the abdominal wall brings the cervix forwards, and fixes the whole of the organ, giving rise to a condition which might easily explain the troubles of the bladder and the accidents of pregnancy. Out of 111 cases operated upon 75 were examined from one to three years after the operation, and in most of them the uterus was still adherent to the abdominal wall. In a few

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there was great mobility of the uterus. One of the accidents following ventrofixation is adhesion of the intestine to the raw surface left at the back of the uterus after detaching the adhesions. To avoid this it is advised to bring down the omentum well behind the uterus, so that it, and not the intestine, may form adhesions to it.

Pregnancy following Ventrofixation.—Out of the 111 cases pregnancy took place in 6. In three pregnancy and labour were perfectly normal, one had pain and elevation of temperature for two or three weeks before delivery, but a perfectly normal confinement; another had a normal confinement but the child was dead, while the remaining one miscarried at the seventh month. Out of a large number of collected cases where the uterus was firmly attached to the abdominal wall, and pregnancy followed, trouble of some kind took place in thirty per cent of the cases, either pain, miscarriage, or difficult labour requiring interference. In the other seventy per cent labour was normal, without other inconvenience than a dragging pain in about half of them. Where the uterus was attached to the parietal peritoneum a few relapses occurred, but the patients were free from pain during pregnancy, and the labours were less tedious, and did not require serious interference.

Out of a large number of cases of pregnancy following Alexander's operation, in no case was the pregnancy or labour unfavourably influenced by it, and as the results of this operation are so good, the author suggests that in cases where there are adhesions, these should be broken down through a small medium incision, and then the round ligaments should be shortened by Alexander's method, after which the abdomen should be closed.

MANN (M. D.) "The surgical treatment of irreducible retroflexion of the pregnant uterus."—*American Journal of Obstetrics*, July, 1898.

IN cases of retroflexion of the gravid uterus, with incarceration, the usual treatment is either to replace the uterus, or, that being impossible, to empty it, and so save the life of the mother. The author, however, recommends that if it is impossible to replace the uterus, the abdomen should be opened and the fundus pulled up by the hand introduced behind it. If the uterus be so large as to completely fill the pelvis, efforts at replacement through the vagina will fail, because when it is pushed up nothing can enter from above to take its place, and when the pressure is withdrawn from below atmospheric pressure forces the uterus down into its old false position.

This occurs even in the knee-elbow position. Also, when pregnancy exists with adhesions, reposition may be impossible until they are broken down by the hand on the inside.

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The author relates two cases where he performed this operation, and in one, which was traced, subsequent pregnancy and labour were normal. In one case it was necessary to tap the bladder above the pubes, but this did not interfere with the result.

Dr. Murdoch Cameron, of Glasgow, reported a similar case, with good results, in 1896. *T. V. Cunliffe.*

BUDIN. "On distocia caused by the ring of Bandl."—*L'Obstetrique*, July, 1898.

IN a clinical lecture on this subject M. Budin relates numerous cases in which he has found considerable difficulty in effecting the delivery of the child owing to the formation of the "retraction ring." The anatomical characters of the lower uterine segment present certain differences from those of the body of the uterus. The membranes are not adherent to the mucosa in this segment as they are in the body. The peritoneum is only feebly attached to the lower uterine segment, and the muscular coat is composed of two layers of fibres only, and is rich in elastic fibres. The limits of the lower segment are, however, most plainly seen when the ring of Bandl (or retraction ring of Schroeder) is fully developed, and this ring is the terminal border of the muscular wall of the uterine body proper. This retraction ring may at times appear early in labour before rupture of the membranes, and may form a great obstacle to the descent of the head. This fact was observed many years ago by Smellie and others, and has been called "antepartum hourglass contraction" of the uterus.

M. Budin refers to the well-known specimen of Dr. Barbour's, which gives a clear anatomical proof of this condition.

The management of the cases may present great difficulty. In vertex presentations the forceps may be applied. They, however, frequently slip. Demelin advises that in these cases the forceps should be applied obliquely or even antero-posteriorly, basing this suggestion on experimental and clinical investigation. Version is often impossible, and may be dangerous. Hence it is often necessary to perform craniotomy or basiotripsy. The same treatment may be required in face presentations.

Demelin has recorded a case in which this ring became well marked in a presentation of the breech with extended legs, and prevented a foot being brought down. In these instances delivery must be effected by the fillet or the forceps applied to the breech.

The retraction ring may form a very great obstacle to version in cases of transverse presentation and necessitate embryotomy.

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If version be attempted in cases of head presentation great difficulty will be met with after a foot has been seized, in procuring ascent of the head, since the retraction ring presses on the neck. Budin recommends that if a foot can be brought down a tape should be fastened to it and gentle traction exercised by an assistant. The hand is then passed along the occiput until the fingers have penetrated beyond the retraction ring. The palm of the hand thus forms a smooth plane along which the head may glide upwards, if at this moment traction be made on the foot by the fillet. Even after version is completed, difficulty may still be met with in delivery of the shoulders and the head.

Numerous cases have also been recorded in which the retraction ring became manifest during the artificial induction of premature labour. This seems especially likely to occur if the hydrostatic dilatations of De Ribes and Boissard are used.

Finally, the ring of Bandl is the cause of the so-called hourglass contraction of the uterus coming on after delivery, and leading to retention of the placenta.

HEGAR (A.). "Tubercular diseases of the uterine appendages."—*Deut. med. Wochenschrift*, No. 45, 1897.

Two principal forms may be recognised, viz.—(1) An *ascending* variety, in which the bacillus has penetrated through the vagina and along the uterine cavity; and (2) a *descending*, in which the pelvic peritoneum has become infected secondarily to tuberculosis of the intestine. In these cases the bacillus probably enters the tube through the fimbriated end.

By vaginal examination the tube may often be recognised as a moniliform cord near the cornu of the uterus. Small nodules, the size of a pea to that of a bean, may often be discovered on the posterior surface of the uterus, or in the lateral and posterior uterine pouches. Sometimes they are also found in the para-vaginal tissue. These nodules are very characteristic when discoverable. They must be distinguished from malignant secondary deposit, from small fibroids, or isolated inflammatory thickenings of the serous covering of the uterus. In one case Hegar made a diagnosis by finding the tubercle bacillus in débris removed by the curette. The general condition of the patient and the existence of tubercle in other organs must be carefully investigated. The symptoms directly attributable to the pelvic condition are often slight and usually of a functional kind, amenorrhœa, dysmenorrhœa, etc.

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The author does not advise surgical interference in very chronic cases in which no active extension appears to be going on. He advises operation if appropriate treatment fails and there are local symptoms present. The abdominal route should be adopted in preference to removal per vaginam.

NASSAUER (MAX). "On the cure of tubercular peritonitis by laparotomy."—*Münch. med. Wochen.*, No. 16, 1898.

SYMS (PARKER). "The surgery of tubercular peritonitis."—*Medical Record*, April, 1898.

NASSAUER has made clinical and experimental studies with the object of ascertaining the mode in which a simple laparotomy acts in exerting a beneficial influence on tubercular peritonitis.

He considers that, as the result of the invasion of tubercle, the peritoneum becomes intensely hyperæmic, and may sometimes, by its strong reaction, check the spread of infection. More frequently, however, the peritoneal reaction is insufficient. The entire organism becomes progressively enfeebled, and death results.

If laparotomy be performed, and especially if a large incision be made, we render the peritoneal reaction already existing much more intense. This hyperæmia continues for many weeks, and terminates generally by checking the tubercular invasion. The exposure to air, chemical reagents, and the evacuation of the fluid, together with the approximation of the peritoneal surfaces, are only of secondary importance.

A cure can readily be obtained without the employment of any disinfectant or the use of a drainage tube. It is undoubted, also, that a simple puncture, even if all the fluid be evacuated, does *not* produce any marked beneficial effect.

Dr. Parker Syms draws the following practical conclusions:—

(1) The danger of the operation is very slight (three per cent).

(2) Infection is less likely to occur than in a healthy peritoneum.

(3) Tubercular infection of the wound itself is never observed.

(4) It is unnecessary to use any antiseptic for flushing the peritoneum, or to insert a drainage tube.

(5) The operation, even if unsuccessful, does not aggravate the condition of the patient.

(6) Tubercular lesions in the lungs are rather an indication for operation than otherwise, since the general condition of the patient is usually so much improved by this procedure.

Arnold W. W. Lea.

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Pharmacology and Therapeutics.

Under the Charge of D. J. LEECH, M.D., D.Sc., F.R.C.P.

Vincent (Swale). "On the general physiological effects of extract of the suprarenal capsule."—*The Journal of Physiology*, Vol. XXII., September 11, 1897, p. 111 ; and February 17, 1898, p. 270. "The administration of suprarenal capsules by the mouth." (Preliminary note.)—*Ibid.*, Vol. XXII., April 25, 1898, p. 57.

The results obtained by different observers from the subcutaneous injection of extracts of the suprarenal capsules into the lower animals have not been uniform. Pellacani and Foà noted fatal effects, and concluded that the extract paralyses the spinal cord and medulla. Oliver and Schäfer found that the dog and guinea-pig were usually unaffected by moderate doses, but larger doses caused some slight transitory disturbance in the rate of heart-beats, in the respiration, and in the body temperature. In the rabbit, on the other hand, death always followed subcutaneous injection of large doses of the suprarenal extract, sometimes half an hour afterwards, but sometimes not for a few days. They found that the heart and blood-pressure were affected by extremely small doses. In the frog a languid condition was produced, voluntary power was diminished, together with reaction to cutaneous excitation, but recovery took place even after considerable doses. The loss of power was shown to be due to the action of poison on the central nervous system ; the languid movements, it was suggested, may be the result of the effect that the extract has in prolonging the individual contraction of the muscle fibres.

In his first communication to the *Journal of Physiology* Vincent records his experiments on the injection of suprarenal capsule, for the most part subcutaneously, in frogs and toads, rats and mice, guinea-pigs and rabbits.

He generally used much larger doses of the extract than had been employed by Oliver and Schäfer.

In frogs the effects noted are similar to those described by these observers, but fibrillary twitchings and spasms were only seen after large doses. Toads require much larger doses than frogs to affect them.

Rats become excited at first ; paralysis of the hind and afterwards of the fore limbs then sets in. In the early stage of poisoning respiration is quick and shallow, and the heart excited. Subsequently the breathing and heart beats become feeble, and finally the respiration is deep and infrequent. Blood appears in the urine occasionally ; the temperature

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falls very low before death, which is preceded sometimes by respiratory convulsions.

In guinea-pigs similar effects are produced. There is some restlessness. Death is caused by an extract of the 6gm. of fresh gland. (Oliver and Schäfer used about 1·29gm. of fresh gland.) Blood-coloured urine was more frequent than in rats, and bleeding from the mouth and nostrils often occurs.

In rabbits the amount necessary to cause death differs much. Some animals need enormous doses, some even less than a guinea-pig. Rabbits become sleepy and listless, not excited. Hæmaturia and bleeding from the mouth and nose never occur. Peculiar attitudes are nearly always assumed. The hind legs become weak and paralysed before the fore legs and limbs are affected. Vincent has proved in two cases that the paralysis is central, not peripheral.

He considers the suprarenal capsule contains an active principle which acts both centrally and peripherally. The central action is upon the motor centres of the brain. The peripheral is indicated by the blood pressure. Whether there are two active substances has not been determined. The central effect may also lead to the contraction of the arteries in some part of the central nervous system. He thinks hæmaturia may arise from the high blood-pressure. The cause of death is doubtful. There seems to be some action upon the respiratory centre.

Vincent notices some indications of immunity being produced by moderate doses of suprarenal extract. In rabbits at least a partial immunity to the action of suprarenal extract may be produced by previous injections, which passes off after a few weeks. He has not found any indication that repeated injections of suprarenal extract caused hypertrophy of the gland capsule such as Caussade has reported. Extract of the liver, spleen, etc., produce no physiological action when subcutaneously injected, like to that produced by extract of the suprarenal capsules. He finds, like Oliver and Schäfer, that the cortical portion of the suprarenal glands is quite inactive as regards appreciable general effects. The toxic material is easily excreted in some way or other, hence the large dose required to kill and ease with which recovery takes place.

The second communication refers to the action of suprarenal extract on cats and dogs.

In dogs the first noticeable effect is excitement, and increased muscular activity which passes into agitation with tremors until paresis and finally paralysis come on. There is abundant micturition but no hæmaturia.

In cats the most notable feature is enormous rapidity of the respiratory movements in the early stage, but paralysis of the limbs is not so definite as in other animals.

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Vincent made experiments on cats and dogs with other extracts, and came to the conclusion that with the exception possibly of the thyroid, the suprarenal gland is the only mammalian gland or tissue which produces toxic effects on them when a boiled and filtered extract is administered subcutaneously.

In the experiments so far made on the effect of suprarenal capsule, subcutaneous or intravenous injection has been for the most part employed, but in the proceedings of the Physiological Society, recorded in the *Physiological Journal*, Vol. XXII., No. 6, Vincent records some experiments on the effects of the administration of suprarenal capsule by the mouth.

Oliver and Schäfer digested suprarenal extract for 24 hours in artificial gastric juice. On injecting the acid solution into the veins of a dog the ordinary physiological effects were very well marked. But a similar amount of dilute hydrochloric acid without the suprarenal extract produced no physiological effect. It has been concluded from this that suprarenal capsule may be administered by the mouth as thyroid is. Vincent, however, has given large doses of suprarenals to a rabbit and dog, and finds no effect produced, from which he infers that in these animals at least, the suprarenal capsule is not absorbed by the stomach. *D. J. Leech.*

GUINARD (L.). "Des rélations pharmacodynamiques qui unissent l'apomorphine á la morphine."—*Lyon Médical*, June 26, 1898.

M. GUINARD has now been engaged for several years on his interesting and important researches on morphine and the other opium alkaloids. Abstracts of several of his papers have already appeared in this journal. (See MEDICAL CHRONICLE, October and November, 1895.)

In the present paper the author points out that apomorphine has hitherto been studied almost entirely as an emetic, and in some works, if any comparison is made between the general effects of this drug and those produced by other agents, the comparison is entirely limited to the group of emetics. Thus it is stated that the effects of apomorphia are like those produced by ipecacuanha and tartar emetic. No one seems to have studied systematically the essential properties of apomorphine itself.

From the experimental studies of comparative pharmacodynamics, carried out by the author on animals of very different species, with morphine and apomorphine, it appears clearly that "all the manifestations of apomorphine are only the reproduction or the simple modification of properties which may be found in the effects of morphine."

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First the nauseating action which makes apomorphine the type of "central" emetics is only the exaggeration of a property possessed by morphine, and which M. Guinard has seen exhibited, following precisely the same mechanism as that which presides over the production of vomiting by apomorphia.

It is in both cases the same action on the bulbar centres, an action constant and dominant for apomorphine, which is especially and everywhere an excitant. As to the expectorant action, all emetics modify bronchial secretion and facilitate the expulsion of mucus. However, there is more than this: apomorphine has a special secretory action, manifested independently of vomiting, and due to stimulation of the excito-secretory centres. It is analogous to that found very markedly with morphine in those animals not narcotised by morphine, and also, but with much less intensity, in animals which can be narcotised, in whom it is observed only during the first phases of the action of the drug. The resemblance is still more remarkable when an analysis is made of the other symptoms.

At the beginning of the action of apomorphine in solipeds, in the bovines, in the pig, in the sheep, in the goat, etc., one notices a peculiar and very constant symptom as regards the movements of the jaws. The animals munch, seeking to eat, seizing and tearing with their teeth any objects they can reach, and biting with more energy the stronger the dose of the drug. They attack even their own bodies if they have nothing better to take, cutting the skin without seeming to notice the injuries they make. Well, this "besoin de manger" is only an exaggeration of that produced by morphine in the same animals—oxen, pigs, sheep, but especially goats, under the influence of morphine have movements of the jaws, grinding of the teeth, seeking to eat or to nibble. The desire, it is true, seems less imperious than with apomorphine, but, apart from the question of intensity, the method of manifestation is the same. Especially in the goat the nibbling action provoked by morphine resembles the similar effect produced by apomorphine. In both cases the phenomenon is due to the exciting effects of the drug on the bulbar centres for the movements of mastication.

The general phenomena, also, produced by the injection of crystallised hydrochlorate of apomorphine in the dog are strikingly parallel to those observed in the horse, ox, pig, or cat which have been injected with hydrochlorate of morphine. There are the same signs of disquietude and agitation, the same restlessness and desire to move about.

The salivary hypersecretion, the vaso-constriction, the stimulation of the chief functions, sometimes the feebleness of the hindquarters and the "hyenoid attitude" complete the resemblance, which may

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even, later, become more striking still by the tendency to move round "en manège" in a more or less confined circle. This last symptom is frequent in dogs under apomorphine; M. Guinard has often seen it in pigs under morphine.

Whenever morphine behaves as an excitant and loses its hypnotic properties one sees produced most of the effects of its derivative—apomorphine. That is why in animals in which morphine has not a soporific effect, such as the horse, ox, pig, sheep, goat, etc., the manifestations of morphinism are very like those which apomorphine produces.

Finally, when, with or without previous hypnotic action, morphine is injected in larger and larger doses, it provokes convulsions similar to those which apomorphine may determine with smaller doses. The convulsant effects in both cases have the same origin, and depend essentially on bulbar influences.

Pharmacodynamically morphine becomes apomorphine by losing its narcotic properties and by exaggerating the different exciting effects which it possesses.

M. Guinard then goes on to show that apart from the narcotising action the influences of morphine and apomorphine on the cerebral centres are strictly analogous. In man the cerebral influences of apomorphine are more those of depression than in animals, leading to a desire for rest and quiet. In animals, such as the dog, the cerebral effects of apomorphine are rather excitant. The animals show psychic troubles, fear, a sort of agitated intoxication, with less power of co-ordination of their acts and movements. The symptoms observed recall those produced by morphine in animals which cannot be narcotised by morphine.

In the action of apomorphine on the nerve centres, particularly in man, there is something special, which, in certain circumstances, makes it disagreeable to use, because of the sudden syncopal states which it sometimes provokes before the nausea, and the more or less alarming collapse which accompanies its action.

These accidents are perhaps more alarming than really dangerous, but they tend to bring the drug into discredit.

Besides the crystalline hydrochlorate of apomorphine, which offers some guarantee of chemical purity and constancy of effects, there is an amorphous hydrochlorate which, in experiments on dogs, acts very differently when injected intravenously in somewhat high doses.

The intravenous injection of this substance causes, after some very transient protective movements, a deep calm, commencing often with a respiratory syncope, along with great lowering of blood-pressure,

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with inertia, complete muscular relaxation, diminution or disappearance of sensibility. These symptoms are quite comparable to the syncopal attacks and collapse observed in man after hypodermic injections of apomorphine. They are not observed with morphine. Animals which have received intravenous injections of morphine are less depressed, and the train of symptoms are less serious than in those treated with apomorphine. Besides, in the cat and the kid amorphous apomorphine injected into a vein is a powerful nervous depressant, whilst similarly administered morphine is always only an excitant for these animals.

It has been suggested that the effects might be due to an association of the two alkaloids, perhaps due to an imperfect chemical transformation and the persistence of a certain quantity of morphine. This supposition has the more plausibility because, according to Merck, the amorphous salt appears to differ from the crystalline in presenting a lower degree of oxidation. M. Guinard, therefore, in other experiments tried the effect of a mixture of morphine and crystalline apomorphine. He found twice in the dog and once in the goat this mixture, by intravenous injection, reproduced well enough the effects of amorphous apomorphine, including the phase of collapse, with loss of sensibility and muscular relaxation. In all the other cases, in the dog, in the cat, and in the ox, the excitant action of apomorphine predominated, but with an exaggeration, often considerable, of the paresis of the hind-quarters and of the depression of the medullar activity. In the sheep results were rather different. A mixture of equal parts of the two drugs usually produced a partial motor paralysis, with prolonged inability to stand upright, paralysis of the extensors, etc., but without collapse, without muscular relaxation, and without loss of sensibility. Without doubt the effects of a mixture of morphine and crystallised apomorphine have much analogy to the effects produced by amorphous apomorphine, but we are not quite justified in concluding that amorphous apomorphine represents an association of apomorphine with incompletely transformed morphine.

It is nevertheless interesting to note that the association of two drugs, each of which, when given alone, in the ox, goat, sheep, cat, etc., act only as excitants, results in the production of depressing and paralysing effects, which may lead to collapse, muscular relaxation, and loss of sensibility.

It is not less curious to observe, on the other hand, that in the dog morphine may bring about the same symptoms which we associate with crystalline apomorphine.

M. Guinard concludes from his study of the question that these two drugs have common origin, very similar elective affinities, and show

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in their pharmacodynamic relations—even the excitant apomorphine—indubitable tendencies to produce the grave effects alluded to, and which are merely exaggerated or produced more surely by combining the two drugs.

Francis J. H. Coutts.

Osler (William). "The thyroid treatment of scleroderma."—*Journal of Cutaneous and Genito-Urinary Diseases*, March, 1898.

The use of thyroid gland in scleroderma has been suggested on the ground that the disease may be due to "dysthyreosis," the consequence of fibrous changes in the thyroid gland, which have been found in a case reported by Singer, and another reported by Hektoen.

Marsh, of Troy (N.Y.), has reported a case of scleroderma in a child, aged two, which followed diphtheria. The thyroid extract, in grain doses, was followed by marked improvement and eventual recovery.

Dreschfeld used the thyroid extract in two cases of diffuse scleroderma. In one there was improvement at first and the skin became softer; when the medicine was discontinued the stiffness increased. There was no ultimate benefit. In the second case no benefit was obtained.

Dr. Lustgarten has referred to a case of generalised scleroderma cured by the use of thyroid extract. Grünfeld reports a successful case, in which the scleroderma disappeared entirely after the use of thyroid gland extract, no atrophy being left in the affected areas.

Lewin and Heller refer to four cases, all unsuccessful.

Dr. Osler used thyroid preparations in six of the eight cases reported in this paper. One case took the medicine for a few weeks only, and her friends stated that she improved slightly; another case improved during the seven months she was taking thyroid extract, in doses of two to five grains, three times a day; general tonics were, however, also administered. In other cases the drug was taken for periods varying from ten days to 19 months without any apparent benefit.

The thyroid extract has certainly no specific action in scleroderma, as it has in myxœdema. In no case did the skin of the affected regions become softer or regain its natural appearance. In two cases the disease did not progress under its use.

One interesting point is brought out, namely, the harmlessness of the protracted use of the thyroid extract: two of the cases—one with tachycardia—took it for eighteen months, and another for nineteen months, without any ill effects; the latter case gained weight.

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Altogether personal experience and the results recorded in the literature do not favour the treatment of scleroderma by the thyroid gland extract. It may be tried without harm, and should it fail frictions and salicin preparations should be used.

Robert B. Wild.

"Atropine in the treatment of dyspepsia, attended by excess of hydrochloric acid."—*Therap. Gazette*, June 15, 1898.

Dr. Turner states that Dr. Plesoianu, of Bucharest, has lately published an account of the results obtained by the use of atropine in cases of dyspepsia, attended by excess of hydrochloric acid. In it he notes what has been done in Russia by Drs. Mitchaiew and Panow with this drug. It has been used in France by Bouveret, Mathieu, and Hayem. This form of dyspepsia is accompanied not only by hypersecretion, but by pain, and as a necessary consequence by a certain degree of spasm, which may occur at the pylorus, causing the retention of the food in the stomach.

Atropine is consequently most useful in such cases, as it diminishes the secretion, decreases pain, and reduces the spasm. Bouveret and Devic gave it hypodermically, but did not obtain favourable results. Dr. Plesoianu recommends the following method:—

Atropine sulphate.....	1 centigramme.
Distilled water	10 cc.

Ten drops of this solution are to be given daily, divided into three doses. The dose may be increased in two to three days to twenty drops daily, provided no untoward symptoms develop, and then, drop by drop, the dose may be carried to 50 drops, and then reduced in the same way to twenty drops. Thus from one to two milligrams are given daily.

Dr. Pouchet, Professor of Pharmacology at the Faculty of Medicine, Paris, recommends the following prescription:—

Atropine.....	1 centigramme.
Glycerine (28 per cent).....	3·5 cc.
Distilled water	1·3 cc.
Alcohol (95 per cent) q.s.....	to 10 cc.

Fifty drops of the above are equivalent to one milligramme of atropine.

The important factors in the method of treatment are exact doses and gradual increase. Attention should be given to the danger signals of atropine poisoning, such as dilatation of the pupil, dryness of the throat, and flushing of the cheeks.

"The treatment of hæmophilia by thyroid gland."—*Therapeutic Gazette*, June, 1895.

Delage has reported the case of a woman who, because of hæmophilia, suffered from excessive anæmia. She was exsanguine in appearance, the buccal mucous membrane being absolutely colourless. The gums bled easily on touch, and the extremities and body were covered with a purpuric rash. Menstruation was profuse, and lasted from 12 to 14 days. She was treated by the various hæmostatics, and by repeated injections of ergotin without much result. Seeing that Vigier had employed capsules of thyroid gland in the treatment of metrorrhagia, Delage concluded to try this remedy, and three capsules of thyroid gland were given each

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day, with the result that the loss of blood was immediately arrested. The patient gained in weight, the purpuric spots disappeared, the gums became firm, and some colour began to appear in the face. Cardiac palpitation was decreased. At no time was the dose greater than three capsules a day.—*Journal de Médecine de Paris*, January 23, 1898.

"Treatment of dyspepsia."—*Therapeutic Gazette*, June, 1898.

ROBIN recommends the following prescription in cases associated with pain and pyrosis:—

R. Hydrated magnesia	20	grains.
Subnitrate of bismuth	6	,,
Prepared chalk	8	,,
Bicarbonate of sodium	15	,,

These quantities are to be made into one powder, and twenty similar powders given to the patient. One of these is to be taken three hours after meals. Should the pain be necessarily severe, $\frac{1}{60}$ grain of hydrochlorate of morphine or $\frac{1}{4}$ grain of powdered opium may be placed in each cachet. For the arrest of acetic fermentation, absolute avoidance of alcoholic drinks must be insisted on, and where lactic fermentation is marked, the quantity of fruit eaten should be limited. Such cases may be benefited by the administration of fluoride of ammonium 15 grains, distilled water 10 ounces; one or two teaspoonfuls of this solution to be given three times a day when the discomfort is felt.—*Rev. du Thérap.*, January 15, 1898.

"Massage in the vomiting of pregnancy."—*Bul. gén. de Thérap.*

JEFFROI strongly recommends massage in the treatment of this condition, and reports cases in which it has been followed by excellent results. He finds it usually requires only five or six applications to produce complete cure. The massage is applied to the region of the stomach and duodenum, where nearly always some marked tenderness exists.

"Orthoform in nasal catarrh."—*Rev. de Thérap.*, No. 10, 1898.

FOR this troublesome ailment Dr. Blondl recommends insufflation, morning and evening, of a small quantity of orthoform. It has the advantage of being a harmless remedy, and undoubtedly possesses sedative properties.

"Salophen in rheumatism."—*Therap. Monats.*, July, 1898.

KLIMENKO has employed salophen in 40 cases, giving 15 grains six times daily. It has a good effect in acute and chronic articular and muscular rheumatism and in neuralgia. In megrim and influenza, on the other hand, he found it useless.

"Use of hyoscine hydrobromide in mental diseases."—*Therap. Monats.*, June, 1898.

DR. W. DOERNER, assistant in the department of mental diseases of the Freiburg Clinic, says that the hydrobromide of hyoscine is preferred there to the hydrochloride, on account of its milder action and greater freedom from unpleasant effects. It is given in doses of $\frac{1}{120}$ to $\frac{1}{70}$ grain.

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In cases of mental excitement, with delirium and destructive tendencies, and especially in periodic mania, he finds it of great value.

He confirms the statements made with regard to its value in the delirium of alcoholics.

In melancholia agitata, as well as in other cases of sleeplessness, hyoscine often produces quietude when all other means fail.

On the other hand, it is not adapted for all cases of an hysterical nature, and especially in affections which require the constant use of sedatives. The only unpleasant effects are dryness in the throat, disturbance of vision, and more rarely an evil effect on the heart, but it is possible, if continuously taken, nutrition may fail somewhat.

Marked valvular trouble and fatty heart contra-indicate hyoscine.

"Cimicifuga racemosa in the treatment of noises in the ears."

ALBERT ROBIN and Mendel, in a communication to the French Society of Otology, May 5, 1898, recommend the fluid extract of cimicifuga racemosa in cases where there are "noises in the ears" independent of ascertained physical changes. They point out that cimicifuga in large doses produces sickness, loss of strength, headache, and a condition like drunkenness, and they say that it acts on the heart like digitalis, but less strongly. It has been used in many ailments, and is regarded by some as a specific in joint rheumatism, but its value in this ailment is not confirmed. In the relief of "noises in the ears" cimicifuga is most successful where the condition has not been long present. The liquid extract should be given at first in doses of 10 to 15 drops, and this quantity may afterwards be increased if necessary. They state that in 9 cases its effects were complete and rapid. The drug was of no use in 3 others which have lasted respectively 5, 10, and 48 years. In one of the 9 cases the ailment returned, and was then uninfluenced by the drug. In a second the good effects did not appear for nine months, but there is reason to believe that the patient did not take the medicine regularly. In the other cases the relief of the subjective noises took place within two days after the drug was commenced with. It seems to take away congestion of the middle ear, if such a condition is present. They considered that cimicifuga acts on the circulation in the ear, and diminishes the irritability of the auditory nerve, whether affected directly or in a reflex manner.

Diseases of the Throat and Nose.

UNDER THE CHARGE OF A. HODGKINSON, M.B., B.Sc.

VAUGHAN (P. T.). "Some remarks upon syphilitic manifestations in the larynx."—*Atlanta Medical and Surgical Journal*, June, 1898.

THE author speaks from large experience of cases of syphilis visiting Arkansas for the thermal waters. He dislikes the arbitrary division of syphilis into three stages, as he has often seen irregularities—*e.g.*, mucous patches in the throat as long as fifteen years and gummata only six months after the primary sore.

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Mucous patches in the larynx are rare, but, when present, prefer the upper surface and free margin of the epiglottis, the false cords, and sometimes the interarytenoid commissure. Catarrh and erythema occur in the second stage. The catarrh of the larynx has no special feature, except the necessity of anti-syphilitic treatment for its relief. Erythema associated with alternating patches of red and white on the cords leads one to suspect its specific origin. Erythema produces no uncomfortable symptoms, unless the vocal cords are involved; then there results impairment, and, in some cases, complete loss of the voice.

Gummata are commonly situated near the posterior commissure, upon the arytenoid cartilegas, and upon the epiglottis, and result in a destructive ulceration. This ulcerative process may be superficial or deep; the superficial belongs to the secondary stage. The author believes both kinds to be due to gummata, the superficial occurring when the tumour is just below the membrane, and the deep when the tumour is situated more deeply. Specific ulceration is very rapidly destructive, and stenosis and great distortion may result.

The author then enters into differential diagnosis. The most difficult to distinguish from syphilis are cases of malignant disease, and the effect of treatment with iodide must decide.

The following conditions have harmful influence on the course of syphilis: Anæmia and general malnutrition, tuberculous infection, chronic nephritis, arterial disease or arterio-sclerosis, and malaria. The last appears to cause an increase in the severity of syphilitic symptoms, and especially of the neuralgic symptoms.

The mucous patch in the larynx should be touched daily with tincture of iodine. Catarrh requires (besides mercury internally or by inunction) the administration of iron, and locally of sprays.

For the tertiary stage, iodide of potassium or sodium should be given in 10 to 20 grain doses three times a day, increasing the doses by several grains daily till the progress is checked. With the use of hot springs larger doses are tolerated, on account of the hot baths and their diaphoretic action.

In cases of severe ulceration, and where there is impending disintegration of gummata, it is best, for quick action, to use mercurial inunctions and the iodides.

Dilatation of resulting strictures is best done by Schroetter's three-bladed dilator.

When the larynx is not too much distorted, an intubation tube may be used; and in these cases iodide of potassium is not called for, as it produces a variety of iodic laryngitis.

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WALSH (J. E.). "Diphtheria."—*The New York Medical Journal*, June 18, 1898.

A COMMON fallacy amongst the medical profession is that diphtheria is only a local disease, and that when the membrane has gone the patient is cured and cannot infect others. The author briefly reviews the history of this disease, and then gives the following classification :—

(*a*) Staphylo-angina (caused by the staphylococcus pyogenes), a comparatively mild affection, characterised by quick pulse and rapid rise of temperature to 103°, pain on deglutition, with red and swollen tonsils, and "follicular ulcers" seen here and there. Temperature is normal on second or third day, and there is quick recovery.

(*b*) Strepto-angina (caused by the streptococcus pyogenes) is the most painful of all. Temperature rises more gradually to 102° or 103°, and remains stationary for several days. The inflammation affects tonsils, fauces, pharynx, posterior nares, and eustachian tubes, and sometimes the glands of the neck are swollen. There is great pain on swallowing and often much prostration. The membrane does not cover all the inflamed surface usually, and is thin and yellowish-white or greyish-white; it disappears in a few days, but the swelling of tonsils, etc., remains for several days, and recovery is slow.

(*c*) Angina (Klebs-Loeffler) is the third variety, and is true diphtheria. The author here enters into the technique of cultivation and examination of the germ first discovered by Klebs and cultivated by Loeffler.

If the bacteriological report in a throat case is that there is no growth of any kind, do not regard it as necessarily favourable, as probably some incidental circumstance, such as the taking of the culture immediately after the application of an antiseptic to the throat, etc., has prevented growth. The size and shape of the varieties of the Klebs-Loeffler bacilli has not been proved to bear any relation to the severity of the attack.

The author then dwells on the presence of the bacilli in throats of apparently healthy people, and gives instances to show how such people convey infection without themselves suffering. He quotes the experience of the New York Infant Asylum and another institution to show the benefits derived from isolating all in whose throat the bacillus is found, and from immunizing with antitoxine.

The persistence of the bacillus after disappearance of symptoms and membrane varies in the author's experience of 2,500 cultures from 800 cases from the sixth day to the eighth week; and the period of persistence bears no relation to the severity of the attack, reason of prevalence, the age of the patient, or his environment; nor does the administration of antitoxine affect it. A table is given showing the

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average persistence of the germ at different ages for winter and summer. Life in the open air in the country does not seem to hasten the disappearance of the bacillus.

From a sanitary standpoint, he does not recognise the pseudo diphtheria bacillus, and in doubtful throat cases calls it the bacillus diphtheriæ. Susceptibility is not a family characteristic. The author believes that the prevalence of diphtheria is not affected by overcrowding, squalor, dampness, or unsanitary conditions of dwellings; on the contrary, it seems to be more common among the moderate and well-to-do classes. Sunshine and fresh air are, however, factors in decreasing the prevalence of the disease. The white race is more susceptible than the coloured. Children under twelve years of age are specially susceptible. The disease is slightly more prevalent among females than males. Contagion is through the germ laden saliva getting about the bed and the dress of the attendant, etc. The disease is not given off in the breath except during expulsive efforts at coughing. Books and other school articles convey infection. He then reviews the symptoms of diphtheria. The period of incubation is two or three days.

Treatment.—The author gives the following table as showing the value of the antitoxine treatment in Columbia:—

1895–96.

Cases treated with antitoxine	174
Cases treated with other methods	152
Died after the administration of antitoxine	23
Died after other methods of treatment	53
Mortality with antitoxine	13·2 per cent.
Mortality without antitoxine	34·9 „

Other tables follow, showing the special advantage of antitoxine treatment in cases under twelve years of age.

The only bad effect of antitoxine is urticaria. The decrease in hæmoglobin and in red blood corpuscles is less during antitoxine treatment than under other methods.

Hobbs (Arthur G.). "Mouth breathing in children, particularly as a result of adenoids."—*Atlanta Medical and Surgical Journal*, June, 1898.

The author, after a review of the subject of nasal obstruction, recommends for the removal of adenoids, with or without anæsthesia, the use of his own forceps, with small shanks and large fenestræ, so as to rapidly make a number of grasps before withdrawing the instrument. He does not believe that total removal of adenoids is essential, though desirable.

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TOMPLITZ (MAX). "Mycosis pharyngis leptothricia." — *New York Medical Journal*, June 25, 1898.

BENIGN mycotic conditions are as follows: Thrush (caused by oidium albicans), nigrities linguæ (black tongue), mycosis sarcinica and aspergillina and mycosis due to yeast and leptothrix. The author briefly refers to the literature of these conditions. Mycosis leptothricia presents two forms—a diffuse and a circumscribed. In the diffuse form the tongue is uniformly coated with a milky glistening mass, completely covering the filiform and fungiform papillæ, and causing the base and lower surface of the tongue to appear almost entirely level. Ubisch first exactly described this condition, and in his patient the general condition, digestive functions, and sense of taste were good.

The circumscribed form, first described by B. Fränkel in 1873, is illustrated by the following cases observed by the author:—

(1) A painter, aged 31, always healthy, noticed in October, 1885, an unpleasant rough sensation in the throat, with "a constant irritation" and desire for hawking, followed by mucous discharge. No relief followed his doctor's treatment. In March, 1886, he had an acute febrile attack, with swelling of the face, closing his eyes. This lasted a week. In May, 1886, the author saw him and discovered a firmly adherent excrescence, ½ centimetre long, grayish white, on the left tonsil. Other loose white granular masses were found between the tonsil and the post. pillar. About ten other white prominences were, with force, removed from the lower portion of the post. pillar and the papillæ circumvalatæ and fungiformes. The patient, an extreme hypochondriac, had lost flesh, and believed himself consumptive. He completely recovered after six weeks of treatment.

(2) A female, 19 years of age, was not caused much inconvenience by the presence of excrescences similarly situated. The author mentions a third case.

Tonsillar mycosis is distinguished from diphtheria by the absence of inflammation and of fever, the discrete, non-confluent appearance of the foci and the implication of the lingual base.

The febrile symptoms, brittleness and easy removal of the masses, define acute follicular tonsillitis from tonsillar mycosis. Mycosis leptothricia readily follows an acute follicular tonsillitis or diphtheria. He refers to the misinterpretations of the nature of the excrescences, especially in the case of Dr. D., fully described by Herzug. Dr. D. was cured in two months by smoking cigars. The author then reviews the literature on the subject. The microscopical examination of leptothrix is made by the removal of the masses with forceps, adding a five per cent solution of caustic potash and placing in glycerine. Pavement

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epithelia are found interspersed with light refracting granules, surrounded by a yellowish mass, which contains round light refracting rods, and at places long threads in bundles, clusters or sheafs. They are not linked nor branched, but frequently reticulated. By the addition of Lugol's solution, the rods and threads stain intensely blue, and the granular masses slightly bluish. Leber demands the addition of acids (not sulphuric), whereupon violet coloration takes place. The specimens stain well with gentian violet and methylene blue. The rods and threads are not stained entirely blue, and so have a linked appearance.

Siebenmann's view of the nature of the affection is next quoted, and the author touches on the discovery of leptothrix, its classification, its part in the decay of teeth, its power to dissolve lime salts and of forming lime incrustations; and then briefly deals with the subject of cultures.

Treatment.—The author uses the sharp spoon and electro-cautery, and in cases complicated by stomach disease, the treatment of that organ is advisable.

WACHENHEIM (F. L.). "The clinical relations of the Loeffler bacillus." *New York Medical Journal*, June 18, 1898.

BRETONNEAU claimed a common origin for croup and malignant angina, declaring them due to the same infecting agents, necrotic changes being due to secondary influences. Virchow distinguished "diphtheritic inflammation" from "croupous inflammation," necrosis of the underlying tissues accompanying the first and being absent in the second.

The author, excluding chronic tonsillitis and suppurative tonsillitis, gives the following classification of tonsillar inflammations :—

(1) Catarrhal angina, marked by simple hyperæmia and increased succulence.

(2) In addition to the inflammation as above, there are white dots about the size of a pin's head in the lacunæ.

(3) The spots are larger and spread over the surface of the gland with a tendency to coalesce.

2 and 3 form the follicular angina group.

(4) The coalescence of the patches in the third form makes the fourth group.

(5) The fifth is Virchow's diphtheritic angina, and includes so-called gangrenous tonsillitis.

Loeffler, Escherich, Kossel, and Baginsky found the bacillus in 92 to 97 per cent of primary diphtherias.

Whether the pseudo-Loeffler bacillus is an attenuated Loeffler or a distinct form is still *sub judice*.

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There is little doubt about the infectiousness of streptococcus cases. Bernheim, Roux, and Yersin have proved the high virulence of mixed Loëffler bacillus and streptococcus infection.

Koplik found Loeffler bacilli in many cases of punctate and most cases of disseminated croupous angina.

The bacillus has been found in many normal fauces. It has been shown also to be the cause of fibrinous rhinitis.

The bacillus was found by Belfonti to persist in certain cases in convalescence even as long as seven months. The germ persists longer where there is chronic inflammation of the air passages. Out of 16 cases collected in the past year by the author, the Loeffler bacillus was found in 10. He mentions 9 of the 16 cases.

Of 14 cases of lacunar and catarrhal angina only one presented the bacilli. This case escaped further observation.

The author, guided by the following considerations—the delay necessary for the preparation of cultures and the fallacies associated with the recognition of the germ under the microscope alone, the unreasonableness of isolating healthy people in whose throats is found the bacillus, and the reasonableness of isolating cases of streptococcus infection—concludes that our diagnostic procedure is practically restricted to that of Bretonneau; that bacteriological results are at the best only confirmatory, and that we must manage our cases from the outset from a purely clinical standpoint. Sero-therapy should at once be used without waiting for a bacteriological report, as delay is harmful. In strictly lacunar tonsillitis it will probable not be called for in any case. *R. M. Fenn.*

Pathology and Bacteriology.

UNDER THE CHARGE OF A. SHERIDAN DELÉPINE, M.B., B.Sc.

CRAIG (C. F.). "The branched form of the bacillus tuberculosis in sputum."—*Journal of Experimental Medicine*, May, 1898.

MANY observers have demonstrated the presence of filamentous, branched, and budding tubercle bacilli in culture growths, both in human and avian tuberculosis.

Metchnikoff, in 1888, described these forms, and suggested the name Sclerothrix Kochii for the bacillus. Others have noticed similarity in appearance and arrangement to the ray fungus, and Baber and Levati

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have demonstrated in tubercles produced by intra-cranial and intra-vascular injections of the bacilli, typical ray-like colonies with clubbed bacilli.

The question has been raised whether the tubercle bacillus can any longer be classed among the Schizomycetes, and be placed in the same class as the ray fungus.

Dr. Craig records his observations on the tubercle bacilli in the sputum of a young woman suffering from rapidly-advancing pulmonary phthisis.

The expectoration was abundant, of offensive odour, and contained a large amount of elastic tissue. The preparations were stained with phenyl fuchsin, and decolourised with 20 per cent nitric acid, but were not double stained, so that all but the bacilli were decolourised.

He found the ordinary bacilli much the more numerous, but also found all stages of the branching forms.

(1) A small bud, usually lateral, staining like the bacillus, with sometimes a small unstained speck in it, which resembles the unstained portion of the bacilli.

(2) Branches of shorter length than the parent bacillus, staining uniformly throughout.

(3) Branches as long or longer than the parent bacilli, and which gave off other secondary branches, uniting with others and forming fantastic shapes. These all must be distinguished from the false branching bacilli, which are ordinary bacilli in apposition, and can be distinguished by careful focusing.

As to the cause and significance of these branching forms there is great difference of opinion.

They are frequently noticed under unfavourable conditions, as on old cultures and in a rapid phthisis. The necessary pabulum may be exhausted.

On the other hand, they have been shown in fresh miliary tubercle.

Some observers consider it a degenerative or involution form of the bacillus, but the more general opinion is that our view must be modified as to the classification of the organism.

Klein suggests it is a reversion to an ancestral type which had a mycelial growth.

Bruns declares that they are a saprophytic growth form of an organism which as a parasite on the animal body has the form of rods.

Other observers place it with the streptothriciæ, and have given it many names suggesting its mycelial qualities, such as mycobacterium tuberculosis, tuberculomyceos, etc. *J. R. Carver.*

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OBICI (AUGUSTO). "On the pathogenic properties of aspergillus fumigatus."—Ziegler's *Beiträge zur Pathologie*, Vol. XXIII., p. 197, 1898.

Clinical Observation.—The basis of the following investigation was a case of aspergillosis observed by the author in March, 1896. N. U., 24 years of age, medical student, in the summer of 1891 observed a tickling in the throat, and expectorated a nummular mass about half an inch in diameter, black on one side, grey on the other, somewhat soft and friable. This recurred at first every month, later every twelve or fifteen days. At this time the patient complained of pain in the right side of the chest, and had bronchial catarrh. Occasionally, for a few days preceding the ejection of the mass, the patient felt as if a flap were moving on the right side and obstructing respiration, which sensation, however, disappeared with the ejection. Patient contracted syphilis, but is uncertain whether before the commencement of mentioned derangement or shortly after.

Physical signs, March, 1896: No impairment of resonance over the apices; a little bronchial catarrh on both sides. Immediately preceding ejection of the mass, small bronchial râles with inspiration, were heard over the right shoulder blade. Laryngoscopic examination showed only slight redness of the mucous membrane of the larynx and trachea.

The ejected mass, examined microscopically, was found to consist of a dense feltwork of mycelial threads and spores, which, on cultivation on various media, proved to be aspergillus fumigatus. The sputa between the times of ejection contained mycelial threads, spores of aspergillus fumigatus, bronchial epithelial cells, and leucocytes. No tubercle bacilli were found.

It seems probable that the expectorated masses were formed on an ulcer in the right bronchus. Liebeman tells of a similar case found post mortem in a woman. Zürn noticed aspergillus fumigatus vegetating on the surface of an ulcer in the trachea of a cow.

The following series of experiments were conducted with a view to determining the pathogenicity of aspergillus fumigatus:—

(1) *Direct Injection of Spores into the Circulation.*—Emulsions of spores, grown on acid glycerine agar, were injected into the axillary vein in pigeons, and into the auricular, jugular, and mesenteric veins (after laparotomy) in rabbits. The inoculation was followed by a transient rise of temperature of half to one degree. For a few hours before death it became subnormal. Death occurred in two to twelve days, according to the number of spores inoculated. In each experiment the organs were subsequently examined for the fungus by cultivation and histological methods.

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Pigeon No. 1: 1 ccm. emulsion injected into the right axillary vein. The animal died after six and a half days. Post mortem, the liver and lungs contained numerous greyish miliary nodules; the spleen and kidneys were congested; other organs were normal. Microscopically, the pulmonary nodules consisted of lymphoid cells and many giant cells, the nuclei of which were arranged round the periphery. No tubercle bacilli were found. The surrounding alveoli were filled with desquamated epithelial cells, white and red blood corpuscles. In some places there were true hæmorrhages, while the whole lung was congested. Mycelial threads were found in the fresh tubercles, and also in sections stained by Weigert's fibrin method. In the liver the tubercles were more numerous, and were composed of many giant cells, with centrally-disposed nuclei, and many lymphoid cells. In the neighbourhood of the small tubercles, thrombosis of the vessels was remarkable, and also granular and fatty degeneration of the liver cells. Mycelial threads were found in the centres of the tubercles. The spleen contained a few tubercles, which were undergoing caseation in the centre, with here and there giant cells. Other organs were normal, except the kidneys, which showed considerable desquamation of the epithelium of the convoluted tubules, with small, scattered groups of small cell infiltration between the capsules and loops of the glomeruli. In the midst of these groups small aggregations of spore-like bodies were found, which, with thionin, became red violet.

Pigeon No. 2: 1 ccm. emulsion injected. It recovered after the first injection, and was little affected by a second of 2 ccm. This pointed to an acquired immunity, which however was not lasting, for a third injection proved fatal.

Pigeons Nos. 3 and 4: These two pigeons were inoculated with 2 ccm. and 1½ ccm. of emulsion respectively. One died on the eighth day, the other on the ninth day, after inoculation, and presented lesions practically identical with those of the first pigeon.

Rabbit No. 1: 1 ccm. emulsion injected into the left auricular vein. The animal died six days later. Post-mortem appearances were similar to those of Pigeon No. 1, with the following special points: The left auricular vein was thromboses; there was a little fibrinous exudation on the visceral pleura; the kidneys contained tubercles in the cortex and medulla; the back muscles contained numerous tubercles; the pulmonary tubercles were caseated in their centres and contained no giant cells, in spite of which in the oldest tubercles the mycelial threads appeared partly disintegrated and destroyed, although Ribbert attaches great importance to the presence of giant cells for their destruction.

The following experiment was made to study the changes produced in the liver a few hours after the injection of spores into the portal vein:

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Rabbit No. 2: After laparotomy, 1½ ccm. emulsion was injected into a mesenteric vein. The animal was killed 15 hours later. In the liver numerous small collections of leucocytes were found, in the neighbourhood of which there was active desquamation of the endothelium of the vessels. Some liver cells were in a condition of coagulation necrosis, others showed nuclear fragmentation. Spores were found in the tubercles but no mycelial threads. The spleen also showed similar collections of leucocytes. The kidneys showed distinct glomerulitis. In the lungs the commencement of small tubercles was found, with catarrhal exudation in the bronchioles.

(2) *Feeding with Spores of Aspergillus Fumigatus.*—In this series of experiments various animals received food containing spores of aspergillus fumigatus.

Guinea-pigs died in 10—16 days, presenting a condition of catarrhal enteritis. All the organs were more or less congested, and in the liver, kidneys, and lungs small nodules of lymphoid cells were found. Cultures of aspergillus fumigatus were obtained from the contents of the intestinal canal, and from the spleen, liver, lungs, and kidneys after 3—4 days.

A rabbit, dead after 24 days, showed in addition, infection of the lymph glands at the root of the mesentery.

In the case of a pigeon which received food containing spores, at first daily, but later only every two or three days, and died after two months, the appearances were very similar, differing only in that tubercles were also present in the spleen, and that whilst the intestine showed no gross lesion, the fungus (spores and mycelium) was found in the submucosa.

These experiments showed that spores of aspergillus fumigatus can produce lesions of the gut, with emaciation and death, in 20 days—2 months. The vital activity of the fungus is not impaired, for virulent cultures can be obtained from the contents of the rectum. No special lesions were found in the stomach, whilst in the small intestine there were small swellings containing spores, mycelial threads, and lymphoid cells. In the submucosa there was plentiful infiltration of blood pigment. Cultures and microscopical examination showed that the mycosis might extend sometimes to the mesenteric glands and other organs, the brain only never having been found affected.

In a series of simple experiments made by Renon on rabbits, results were obtained which differed in no practical point from the above, save that extension to other organs did not occur.

(3) *Injection of Aspergillus Fumigatus into the Subcutaneous Tissue.*—Experiment 1: A rabbit was inoculated subcutaneously in the neck with 1 ccm. of emulsion. After two days the animal was killed, and presented post mortem indications of a local reaction only. Microscopi-

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cally this reaction was seen to consist of small cell infiltration, in the midst of which groups of unchanged spores could be seen. No mycelial threads and no traces of aspergillosis were to be found in the organs.

Experiment 2: In another rabbit, injected similarly, neither spores nor mycelial threads were found, but only granulation tissue.

Experiment 3: One ccm. of emulsion was injected into the subcutaneous tissue of a pigeon. A few days later a bluish swelling could be seen at the place of injection, which became yellowish, and disappeared in eight days. The animal showed no derangement from the injection.

These experiments showed that the subcutaneous tissue is an unfavourable ground for the development of the aspergillus fumigatus. There was no pus formation, and only rarely death occurred owing to diffusion of the aspergillus in consequence of very plentiful injections, as was the case in a rabbit injected by Renon.

(4) *Injection into the Peritoneal Cavity.*—As a result of injecting spores into the peritoneal cavity Obici found that in a rabbit the spores rapidly became surrounded by masses of granulation tissue (tubercles) which thus prevented their development and dispersion. In a guinea-pig, on the other hand, the spores spread over the entire serous membrane, and eventually infected the liver and lungs, a result as regards the peritoneum very similar to those obtained by intravenous injection or by feeding in the manner described. Thus, on one of the pigeons inoculated intravenously the section showed the existence of acute serofibrinous peritonitis and tubercles on the surface of the liver. Renon found aspergillar peritonitis of ascitic form in conjunction with lesions of the gut in a rabbit, which had been intravenously injected. The other serous membrane may be attacked by aspergillosis (Grohe). Pleuritic lesions have been produced hy direct injection, and also as secondary to inoculation into the trachea (Dieulafoy, Chantemesse, Widal). Renon noticed it in pigeons spontaneously affected, and also in a rabbit intravenously injected. Grohe only produced purulent arthritis by injecting into joint cavities.

(5) *Injection into Cornea and Anterior Chamber of Eye.*—These experiments were only made on rabbits. As a result of injecting into the cornea, parenchymatous keratitis was produced, being caused by progressive development of mycelial threads, which ran horizontally between the separate lamellæ of the cornea and also directly upon the cornea itself. By injection into the anterior chamber of the eye lesions were produced, as described by Leber. One of three injected rabbits died at the end of three days with tubercles in the lungs, caused by mycelial threads. In this case enucleation of the morbid bulb had not

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taken place. The other two rabbits, the iris of which were extirpated five and eleven days after injection, showed no interior lesions.

(6) *Direct Injection into Brain.*—Rabbits, guinea-pigs, and pigeons were used. Rabbits and guinea-pigs were trephined in the antero-lateral part of the skull, and spores introduced by means of a fine needle syringe, as little as possible emulsion being introduced. At other times a simple inoculation of spores was made with a platinum needle, making the wounds as slight as possible. In pigeons, the skull bones being rather thin, it was easy to penetrate them with a red-hot needle. Through this opening the platinum needle was introduced and driven a few millimetres in the frontal lobe. The injection of a very small quantity of emulsion produced too serious an injury, so that animals died in a few hours, whilst they resisted the inoculation with the platinum needle. In all the cases leucocytic infiltration was found along the course of vaccination, the leucocytes being accumulated round groups of unchanged spores. In some cases the spores were seen within the leucocytes. Some nerve cells had changed into shapeless heaps of protoplasm and granules, not stained by alum hæmatin or saffranin. The degree of leucocytic infiltration varied according to the time elapsed since injection. In no case were mycelial threads found, nor extension to other organs.

The experiments proved that the brain was not a favourable ground for the development of spores of aspergillus fumigatus even when they were introduced directly into its substance. Renon found in a rabbit which had had convulsive movements after intravenous injection no lesions of the nerve centres, a similar result to that found in another rabbit which had after infection become lame in its hind legs. Lucet only found mycotic lesions in the cerebellum of a rabbit which had been seized, after an intravenous injection, with circular movements.

(7) *Introduction of Spores into Trachea.*—Numerous experiments have been made by many observers demonstrating the possibility of producing in animals aspergillar lesions of the lungs by inhalation of spores of aspergillus fumigatus. Pigeons are most susceptible, and die nearly always in 9—11 days, whilst rabbits and guinea-pigs only die in exceptional cases. When they are killed, however, after varying periods, circumscribed lesions of aspergillar nature are noticed in the air passages.

Toxines?—In order to substantiate whether aspergillus fumigatus is capable of producing toxine in culture fluids the filtered products of these were injected into the cornea of a rabbit's eye, into the anterior chamber of the other eye, and into the tissues of the back in two other rabbits. The latter injections were repeated at intervals, but in none was there any local reaction, and the only general derangement noticed

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was an increase of 1 degree in the body temperature, lasting 24 hours. These results agree with those of other observers (Kotliar, Renon, etc.). To determine whether the two rabbits and a pigeon, all of which had resisted the repeated injection of culture fluid, had acquired a certain degree of immunity or not against virulent spores, the rabbits were intravenously injected with 2 ccm. emulsion, and the pigeon with 1½ ccm. All resisted, but the same doses being injected a month later all the animals died of diffuse visceral aspergillosis. These experiments might support the possibility of producing a temporary immunity, although Kotliar did not succeed in so doing. A case has been already mentioned where a certain degree of immunity was obtained (see Pigeon 2). Renon did not succed in producing in pigeons any immunity whatsoever, using for this purpose a dialysed solution of young mycelium in 40 per cent solution of soda. He had some success, however, in injecting a small dose of virulent spores at first, followed later by a stronger dose.

(1) As a result of investigation of the previously recorded cases of aspergillosis, the author concludes the aspergillus fumigatus may affect man and animals, an acute form of infection being described in horses. In man it may be primary, or secondary to some lung disease. The primary form is seen typically in the so-called "gaveurs."

The course of the affection and many of the objective signs, are those of slowly progressing tuberculosis, but no tubercle bacilla are to be found in the sputa, but only fragments of mycelium and spores of aspergillus fumigatus.

Some cases are followed secondarily by tuberculosis (Renon).

(2) The result of his own investigations the author summarises as follows: Certain lesions may be produced experimentally by the injection of spores in certain ways into animals. By injecting into the veins, small tubercles are produced in the organs, which, microscopically, cannot be distinguished from those produced by Koch's bacillus, and are seen to be composed of more or less altered leucocytes, between which numerous mycelial threads, originated by the germination of spores, can be seen. The filaments are always sterile, never are there fruit-bearing hyphæ, except in the lungs, the want of the oxygen in the one case and the presence of it in the other, probably accounting for the difference. In the lungs, as well as in other organs, mycelial threads have been seen arranged in rosettes and stars, similar to the vegetations of actinomycosis. Giant cells are found in the tubercles, to which Ribbert attaches great importance in the destruction of mycelial threads, but in the above experiments, notwithstanding the absence of giant cells, considerable degeneration and partial destruction of filaments has occurred, whilst on the other hand in tubercles rich in giant cells, the mycelial threads were better preserved. The leucocytes forming the tubercles easily

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degenerate, the nucleus breaking up, and the protoplasm changing into amorphous detritus. Coagulation necrosis or caseation is rarely seen. The cells of the surrounding tissue undergo degenerative and necrobiotic changes. There are no appearances of softening or real pus. When large quantities of spores are injected, the organs are filled with mycelial threads, but tubercles have not had time to form before death of the animal takes place. Different organs are not equally affected in intravenous injection, in birds the liver being more often affected, whilst in rabbits and guinea-pigs the kidneys mostly suffer. The brain is nearly always exempted, and direct injection into it proves that it is an unfavourable ground for the development of spores. The gastro-intestinal tube shows lesions both from intravenous injection and feeding. In the latter case the spores may spread through the lymphatic vessels. The subcutaneous tissue is a soil little favourable to the development of spores, local reaction is trifling, and death from diffusion is very rare. After a plentiful injection of spores into the ventral cavity, rabbits and guinea-pigs almost always die in 15 or 20 days (Renon). In some cases, however, a layer of tissue forms round the spores, limiting their development and spread. Inoculation of spores into the cornea causes aspergillar keratitis. By injection into the anterior chamber, the aspergillosis not only spreads into the entire iris, but death of the animal may occur from diffuse aspergillosis. Lesions of the air passages may be produced in animals by the inhalation of spores. The filtered fluid of culture media injected subcutaneously in rabbits and pigeons only caused a transient increase of body temperature of about 1 deg. In a few cases a certain degree of immunity may be produced by repeated injections of toxine (?), and small quantities of spores, but this immunity is imperfect and disappears after a short time.

T. A. Rothwell.

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Local News.

THE VICTORIA UNIVERSITY.

Colleges: Owens College, Manchester; University College, Liverpool; Yorkshire College, Leeds.

RESULT OF EXAMINATIONS.—FACULTY OF MEDICINE.

JULY, 1898.

FINAL EXAMINATION.

PART I.

ALDERSON, G. P. (Univ.).
ALLEN, T. P. (Owens).
ANDERSON, W. J. W. (Yorks).
ANDREWS, J. D. (Yorks).
BRIDGE, H. N. (Owens).
BROWN, J. P. (Owens).
BROWNE, P. A. (Univ.).
BYRNE, J. S. (Univ.).
BYWATER, H. H. (Owens).
CAPAMAGIAN, A. H. (Owens).
CRABTREE, WALTER (Owens).
DAWSON, C. H. (Owens).
EWART, R. J. (Univ.).
FALCONER, E. W. (Owens).
FERGUSON, C. H. (Univ.).
FLETCHER, H. M. (Univ.).
GARNER, CHARLES (Owens).
GREENWOOD, ARCHER (Owens).
GREENWOOD, C. H. (Yorks).
HIME, H. C. R. (Yorks).
HINDLEY, J. C. (Owens).
HOWARD, J. A. (Univ.).
ILLINGWORTH, W. A. (Yorks).
LETT, HUGH (Yorks).
LIBBEY, E. O. (Yorks).
LONGRIDGE, C. J. N. (Owens).
MILLER, J. W. (Univ.).
MORETON, JOSEPH (Owens).
MORRISON, F. A. (Owens).
MORTON, ARMITAGE (Yorks).
PRIESTLEY, A. H. (Owens).
RAYNER, A. E. (Owens).
REGAN, T. E. (Owens).
SCOTT, J. E. H. (Yorks.).
SCHOLEFIELD, HARRY (Owens).
SILVESTER, C. E. (Owens).
SNAPE, HAROLD (Owens).
THOMAS, T. J. (Univ.).
WEST, HARRY (Univ.).
WILKINS, A. G. (Owens).
WINDLE, J. D. (Owens).

PART II.

ALEXANDER, D. A. (Univ.).
ANDERSON, J. W. (Univ.).
CARTER, GODFREY (Yorks.).
DUNK, HARRY (Yorks.).
FIRTH, ARTHUR (Yorks.).
FLOYD, E. W. (Owens).
GREENHALGH, J. P. H. (Owens).
HART, H. F. (Univ.).
HIME, E. M. (Yorks.).
HOYLE, FREDERIC (Owens).
INMAN, F. W. (Univ.).
LOMAS, ALFRED (Owens).
MCNABB, H. H. (Owens).
OYSTON, W. F. (Yorks.).
PICKERING, STANLEY (Owens).
SANKEY, WILLIAM (Owens).
SISSONS, A. T. (Owens).
SPONG, AMBROSE (Yorks.).
STANSFIELD, HARRY (Yorks.).
TROTTER, EDWARD (Yorks.).
TURTON, EDWARD (Yorks.).
WALKER, G. H. (Univ.).
WIGNAL, T. H. (Owens).
WILLIAMSON, JOSHUA (Yorks.).
WINDLE, J. D. (Owens).

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The following have been awarded Honours:—

First Class.

TROTTER, EDWARD ..... Yorks.

Second Class.

FLOYD, E. W. ..... Owens.
SPONG, AMBROSE ..... Yorks.
TURTON, EDWARD..... Yorks.

DIPLOMA IN PUBLIC HEALTH.

BRINDLEY, A. E.
LIGAT, DAVID.
MARSDEN, R. W.
SCHOLEFIELD, G. E.
SCOTT, H. A.

SECOND EXAMINATION.

A.—ANATOMY AND PHYSIOLOGY.

ARNOLD, M. B. (Owens).
BILLING, G. H. (Univ.).
BUDDEN, C. W. (Univ.).
BURNET, ROBERT (Univ.).
COWIN, DANIEL (Owens).
CRAWSHAW, C. W. (Owens).
FERRIS, R. F. (Owens).
FLACK, F. H. (Owens).
FLETCHER, A. H. B. (Yorks.).
FORSTER, R. T. (Yorks.).
GARSTANG, WALTER (Owens).
HAMER, W. D. (Owens).
HULME, E. C. (Owens).
JOHNSON, W. C. (Owens).
JONES, R. J. (Univ.).
LISTER, H. S. (Owens).
PARKER, WILLIAM (Owens).
POLLARD, PERCIVAL (Yorks.).
RAMSBOTTOM, ALBERT (Owens).
ROBERTS, E. C. (Univ.).
ROBERTS, E. E. (Univ.).
SABERTON, C. W. S. (Owens).
SMITHARD, W. R. N. (Owens).
STEPHENS, J. H. (Owens).
TAYLOR, GEORGE (Owens).
TINKER, ERNEST (Yorks.).
UNSWORTH, GEORGE (Owens).
WATSON, J. W. (Owens).
WHITELEY, H. W. (Owens).
WILKINSON, S. C. (Yorks.).
WILLIAMSON, H. M. (Owens).

B.—MATERIA MEDICA AND PHARMACY.

ACOMB, JOHN (Yorks.).
ALEXANDER, D. M. (Univ.).
ASHWORTH, F. H. S. (Owens).
BERRY, H. M. (Univ.).
BILLING, J. H. (Univ.).
BUCKLEY, G. G. (Owens).
BUTTERWORTH, R. N. (Yorks.).
CANTER, W. H. (Yorks.).
COOK, J. B. (Owens).
CORSON, J. F. (Owens).
COX, W. J. (Owens).
CUNLIFFE, E. N. (Owens).
DAVIES, S. W. (Univ.).
EASTHAM, TOM (Owens).
FERRIS, D. J. (Owens).
FLETCHER (R. B.). (Owens).
FLOYD, J. E. (Owens).
GATENBY, F. W. (Owens).
GELDERD, G. W. (Univ.).
GLOVER, V. J. (Univ.).
GREEN, P. H. (Owens).
HEATHCOTE, GODFREY (Owens).
HEATHCOTE, ROWLAND (Owens).
HINDSHAW, JAMES (Owens).
HOLMES, W. S. (Owens).
JACKSON, A. R. (Univ.).

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Johnson, S. J. C. (Owens).
Jones, C. O. (Univ.).
Lloyd, W. G. (Univ.).
Maccormac, W. L. (Yorks.).
Mackey, Charles (Owens).
Martin, A. F. (Yorks.).
Matthews, C. T. (Yorks.).
Mosley, R. V. A. (Yorks.).
Nuttall, J. S. W. (Univ.)
Okell, T. F. (Owens).
Pegler, W. V. (Yorks.).
Platts, Sydney (Yorks.).
Rayner, H. H. (Owens).
Richmond, Arthur (Owens).
Saville, Edwin (Yorks.).
Sawdon, F. R. (Owens.).
Shaw, G. H. (Owens).
Smithard, W. R. N. (Owens.).
Tansley, H. G. (Owens).
Teasdale, J. C. (Yorks).
Tinker, Ernest (Yorks.).
Waterhouse, H. C. (Owens).
Wharton, Alwyn (Owens).
Wilson, B. M. (Owens).
Woolham, J. G. (Owens).

First Examination.

Part II.—Biology.

Anderton, J. W. (Owens).
Bateson, J. H. (Owens).
Bligh, J. P. (Univ.).
Braithwaite, L. R. (Yorks.).
Briggs, Walter (Owens).
Bromhall, C. H. (Owens).
Brown, G. H. (Owens).
Brown, Stanley (Univ.).
Brown, Thomas (Yorks).
Brunskill, John (Owens).
Burkhard, Alexander (Yorks.).
Chadwick, L. T. (Yorks.).
Christian, A. G. (Univ.).
Cooke, W. E. (Univ.).
Cox, E. H. (Owens).
Crawley, E. H. (Yorks.).
Davenport, J. A. (Owens).
Edmonds, A. J. (Owens).
Elder, Douglas (Univ.).
Gregson, A. H. (Owens).
Heapy, H. E. (Univ.).
Henstock, E. W. (Owens).
Herald, Benjamin (Owens).
Hitchin, G. R. (Owens).
Hopwood, C. H. (Owens).
Howard, Arthur (Owens).
Hulme, Ernest (Owens).
Hutchinson, J. R. (Owens).
Irving, Hamilton (Owens).
Johnson, A. E. (Owens).
Johnson, J. A. (Univ.).
Jones, J. A. (Owens).
Joseph, G. W. N. (Univ.).
Knowles, R. E. (Univ.).
Lacey, F. H. H. (Owens).
Ladell, R. G. M. (Yorks.).
Latham, A. W. (Owens).
Laurence, George (Univ.).
Leigh, G. H. (Owens).
Lloyd, J. T. (Univ.).
Longley, J. A. (Yorks.).
Longworth, Joseph (Owens).
Lund, T. H. (Owens).
McCann, J. F. (Univ.).
Maffin, Harry (Yorks.).
Moore, H. E. (Owens).
Nichol, J. H. (Owens).
Radcliffe, A. H. (Yorks).
Rothwell, W. E. (Owens).
Roy, J. A. C. (Owens).
Ryan, S. H. (Owens).
Schofield, F. W. (Owens).
Sergeant, J. O (Yorks.).
Skinner, J. M. (Owens).
Steele, P. K. (Yorks.).
Sugden, Frank (Yorks.).
Suggit, Bertram (Yorks.).
Thompson, A. F. (Owens).
Thorp, Leonard (Owens).
Todd, A. B. S. (Yorks.).
Townley, A. E. (Owens).
Tylecote, F. E. (Owens).
Walker, David (Owens).
Walker, G. F. C. (Univ.).
Winstanley, S. A. (Owens).
Wolstenholme, T. B. (Owens).
Woolfenden, H. F. (Univ.).
Wrigley, W. S. (Owens).

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ANNUAL MEDICAL DINNER.

The annual medical dinner of the Owens College and the Manchester Royal Infirmary will be held at the Albion Hotel, on Friday, October 7th, at 7-30 p.m. Principal Hopkinson, Q.C., M.A., B.C.L., Owens College, will preside. Tickets (10s. 6d. each, not including wine) may be obtained from the hon. sec., Dr. A. T. Wilkinson, 22, St. John Street.

PUBLICATIONS RECEIVED.

From Cassell and Co., London :—

"Elements of Histology." (7s. 6d.) Revised and enlarged edition. By E. KLEIN, M.D, F.R.S., and J. S. EDKINS, M.A., M.B.

From the Scientific Press, London :—

"The Care of Consumptives." (1s.) By W. H. DAW, M.R.C.S.

From Messrs. Jewsbury and Brown, Manchester :—

"Posological Tables." B. P. 1898.

From Messrs. Adlard and Sons, London :—

"King's College Hospital Reports." Vol. IV. 1896-7.

From the Rebman Publishing Co., London :—

"The Ferment Treatment of Cancer and Tuberculosis." (10s. 6d.) By HORACE MANDERS, F.R.C.S., M.D.

"Health Loss, and Gain." (3s.) By M. A. CHREIMAN.

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THE MEDICAL CHRONICLE:

A MONTHLY RECORD OF THE

Progress of Medical Science.

A CRUSADE AGAINST TUBERCULOSIS.

By ARTHUR RANSOME, M.D., F.R.S.,

Late Professor of Public Health, The Owens College; Consulting Physician to the Manchester Hospital for Consumption and Diseases of the Throat and Chest.

A NATIONAL movement for the limitation, and ultimately the abolition, of tuberculosis has recently been commenced; and, judging from the support that it has received from the Royal Colleges of Physicians and Surgeons, from the most eminent members of the medical profession, and from others who rank as the highest in the land, we may fairly hope for a successful result.

It may, perhaps, be interesting to trace the events which have led to this movement, and to point out the direction that it may be expected to take.

The first intimation of the preventibility of phthisis probably came from the results published by the Commission on the Sanitary State of the Army, in the year 1858; results which were ably commented on by the late Sir William Farr, and which both pointed out some of the common causes of the disease, and also indicated the means of prevention by thorough drainage of the soil and free ventilation.

The evidence collected by Dr. Edward Parkes, and published in his great work on hygiene, added force to the conclusions of this Commission, and spurred on to action those who were responsible for the public health.

The discoveries of Dr. Bowditch, in America, and of Dr. Buchanan, in England, also showed the possibility of controlling the spread of phthisis by means of sub-soil drainage.

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The probability of infection by tubercular products, when inhaled, was clearly shown by Villemin, Schottelius, and others; and the conditions under which such infection can take place were shadowed forth by the Report of the Collective Investigation Committee, by my own researches on Tubercular Infective Areas (Epid. Soc.) and by those of Dr. Niven, and of Dr. Flick of Philadelphia.

The strongest impetus to the full recognition of the preventibility of tuberculosis was, however, given by Dr. Koch's discovery of the microbic nature of the disease; and so strong an impression was made upon the public mind, especially on the Continent, as to the contagion of phthisis, that there was, and still is, danger that the conditions of such infection, and the true sources of safety, might be overlooked, and that phthisical persons might, without reason, come to be regarded with as much dread as lepers.

Strength was given to the scare of infection by Dr. Cornet's statistics respecting the Nursing Orders in Germany, and by his researches showing the virulence of the dust upon the walls of rooms that had been occupied by phthisical persons.

Viewed impartially, however, these very researches might have inspired confidence in the disinfecting power of light and air as a protection against infection; for they clearly proved the immunity of hospital wards where these conditions were present.

Other observations, amongst which I may perhaps be allowed to refer to those conducted by myself, along with Professors Dreschfeld and Delépine (*Proceedings of the Royal Society*, Vol. LVI.) also indicated the virulence of tubercular sputum, under certain conditions of soil, light, and air, and its complete disinfection by air in the presence of sunlight.

The attention of most of the medical practitioners throughout the world was, however, almost wholly taken up by attempts to cause all consumptives to disinfect and dispose of their sputum before it could change into tuberculous dust, and thus pollute the air with infectious material.

It is not surprising that this course should have commended itself, in the first place, to those who are interested in the public health. It is obvious that if we could secure, by chemical means, the destruction of the virus on its ejection from the body, infection from this, the most common of all sources of infection, might be expected to die out.

It was speedily perceived, however, that the numerous cases of concealed or unsuspected phthisis, or the presence of ignorant or careless individuals affected by the disease, would completely frustrate the attempts to destroy the deadly seed by ordinary disinfectants; hence there speedily arose a cry for the notification of cases of phthisis,

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and for the segregation of certain of them in sanatoria or hospitals for consumption. Few persons were disposed to trust to the natural disinfection by fresh air and sunlight; although these agents would act automatically and without official intervention.

I believe that Manchester has the honour of being the first town in the kingdom both to suggest, and to partially carry out, measures for the prevention of phthisis.

Seven years ago an informal meeting was held, in my house, of certain members of the staffs of the Manchester Royal Infirmary and of the Hospital for Consumption; and Dr. Tatham, then Medical Officer of Health for Manchester, was also present. A resolution was carried that it was desirable that the houses of consumptive patients at these institutions should be periodically disinfected; and, mainly owing to the courage and public spirit of Dr. Tatham, it was determined that any cases notified to him by members of these staffs, should have their houses thoroughly purified free of cost.

This undertaking was carried out for some time; but was then discontinued, in order that experiments as to the most efficient methods of disinfection might be made by Professor Delépine of The Owens College. These researches revealed that the best disinfectant against the bacillus of tubercle is a one per cent solution of chloride of lime. But I am not aware that the undertaking was resumed after this result was made known.

This effort was not the only one made in this direction. Papers, covering the whole method of procedure, were published on the subject; one by the Manchester and Salford Sanitary Association entitled, "A Campaign against Phthisis," and others by Dr. Niven and myself, before the Society of Medical Officers of Health (North-Western Branch); and it was unanimously determined by this body to carry out the views of the writers of these papers.

Shortly after this date, papers were read at the International Medical Congress in London, by Dr. Squire and myself, dealing with the subject; and I am glad to remember that special stress was laid upon "the need for general sanitary measures" in order to produce "any large reduction in the mortality from tubercle."

Several papers dealing with the subject have since then appeared in the medical journals from time to time,* but unquestionably to Mr. Malcolm Morris belongs the honour of having stirred up the medical profession in London (by his "Tuberculosis Number" of the *Practitioner*); and, under Sir W. Broadbent's leadership, of having brought about the formation of a National League for the Suppression of Tubercle.

* "On Re-infection in Phthisis" (*Med. Chron.*, October, 1892); "Leprosy and Tuberculosis" (*Lancet*, July 11, 1896); "The Consumption Scare" (*Med. Chron.*); "The Limits of Infection by Phthisis" (*Lancet*); "Consumption, a Filth Disease" (*Med. Chron.*, December, 1897, and *Lancet*).

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At the inaugural meeting, at Sir W. Broadbent's, Mr. Malcolm Morris pointed out that other nations had been before Great Britain in starting similar measures of prevention of tuberculosis—notably France, Belgium, and the United States. Quite recently, also, Norway has proposed to legislate on the subject. (*Public Health*, Vol. X., p. 430.)

In the number of the *Practitioner*, already mentioned, Dr. Hermann Biggs gives a full account of the means adopted in the city of New York for the prevention and restriction of pulmonary tuberculosis. The undertaking was commenced in a tentative manner as far back as the year 1893; and in 1897 legal force was given to these measures. They have already proved of great service, and will have to be carefully studied by the leaders of the movement now about to be carried out in England.

This brief review of the chief events which led to the present undertaking may, perhaps, suffice to show its importance and the widespread feeling of its necessity. It will now be desirable to indicate the directions in which effort will have to be made, in order to cope effectively with this formidable malady.

(1) It is important to ascertain the full extent of the evil that has to be dealt with; and, to this end, a complete census of all persons suffering from the malady should be made.

(*a*) Notification of all classes of tubercular disease, as complete as possible, should be obtained; but, as in New York, there should be no intervention between physician and patient in any tubercular case in which the intelligent practitioner may be trusted to give the simple instructions necessary to prevent the transmission of the disease to others. All the arrangements in New York for recording both cases and deaths, and the action taken in order to prevent infection, will probably have to be closely followed in our own campaign against the disease.

(*b*) Similar returns as to the proportion of cattle affected by tubercular disease should be obtained. All herds of cattle will have to be thoroughly inspected, and tested by tuberculin, in order that we may know the exact degree of danger from this possible source of infection.

(2) Measures for the prevention of infection will have to be undertaken.

(*a*) Instructions as to the best means of destroying the sputum, and other discharges from tuberculous patients, will have to be widely circulated. Here again we shall have valuable assistance in the admirable leaflet on the subject, issued by the New York authorities. It is given at length by Mr. Malcolm Morris, in his article in the *Fortnightly* for August, this year.

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(*b*) All the cases of tuberculosis reported to the authorities by their medical attendants as being in need of such help, will have to be visited in their homes by medical inspectors detailed for the purpose. They will both give verbal directions, and will decide upon the best course to be taken in each case.

(*c*) If the case is one which, in the judgment of the inspector, requires special hospital treatment, the fact must be reported to the authority, and the patient will have to be visited, as in New York, by a special inspector, who will determine, by physical and bacteriological examination, the tubercular nature of the case. He will also have to decide whether the patient is in circumstances which prevent him from receiving proper care or medical attendance, or whether he is a source of danger to others. Under such circumstances he will endeavour to have him removed to some special hospital, and will take measures to have his house properly disinfected.

(*d*) The provision of suitable hospitals will have to be another very important aim of the League. At the present time, with the exception of a few hospitals for consumption in London, and still fewer in other parts of the kingdom, the workhouse hospitals are the only refuges to which these poor patients can be sent.

At the inaugural meeting of the Society it was mentioned that one of its objects would be the establishment of suitable "open-air sanatoria" in different parts of the kingdom.

It would be well for the attainment of this object if we could follow the example of Norway, where Dr. Nansen has just succeeded in getting possession of about £100,000, which had previously been set aside for the use of lepers. We have even less danger than the Norwegians from leprosy; and there must be enormous sums somewhere in the country, formerly devoted to "leper-houses," but which are now diverted to other uses, and which might most legitimately be transferred to the treatment of the strictly kindred disorder, tuberculosis.

(*e*) The disinfection of infected houses, whether before or after the death of the occupier, should be, as it is in Manchester, carried out at the expense of the municipality. In New York the process is called "renovation," not disinfection. Dr. Biggs remarks—"This involves the application of simple, and, in tenement houses, inexpensive measures, *i.e.*, scrubbing painted woodwork and floors with hot soda solution, and repainting, repapering, or rekalsomining the walls. . . ."

"Where the consent of the owners can be obtained (and there is now but little difficulty in this) infected bedding, clothing, carpets, etc., are removed . . . to the disinfecting station, and disinfected by steam or destroyed, at the option of the owner, without expense to him."

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(*f*) The danger of infection from tuberculous meat or milk must be averted by thorough supervision of all herds of cattle, by the control of the sale of tuberculous meat, by the gradual formation of herds of non-tuberculous cattle, by the stringent regulation of dairies and milkshops, and by the boiling or Pasteurisation of all suspected milk.

Hitherto, as I have already pointed out, this seems to be all that has been attempted by the organisations in other countries; but, if the disease is to be effectually restrained, much more than this will have to be carried out.

In spite of the best devised schemes of notification, many cases of tubercular disease will slip through the net; there will remain many centres of infection in the unsanitary tenements which exist in all large towns; and places of public assembly, such as theatres, churches, chapels, workshops, public-houses, etc., will still continue to be potent means of spreading the disease.

In addition to the other measures which have been enumerated, the British Society for the Suppression of Tuberculosis will have to promote all those measures of general sanitary reform which have already diminished the disease by nearly two-thirds in this country, and which may be expected to effect still further improvement in this direction.

I trust, also, that they will suggest special measures for the cleansing and disinfection of all places of public assembly; for the ventilation and periodical cleansing of workshops; for the prevention of overcrowding in schools; and for their better ventilation and purification.

Briefly stated, the aims of a Society for the Prevention of Tuberculosis must be:—

(1) The accumulation of information as to the amount and localisation of the disease.

(2) The dissemination of information amongst the general public, and especially amongst the poorer classes, with regard to the precautions to be taken to prevent its spread.

(3) The enlightenment of local authorities as to their duties in regard to its prevention; especially respecting milk and meat supply, the disinfection of dwellings, and the examination of tuberculous products, free of cost to individuals.

(4) The promotion of improved building byelaws in all the chief towns in the country, and encouragement of the inhabitants to obtain more civic "lung-space" in the shape of parks and open pleasure-grounds.

(5) The establishment of "open-air" sanatoria for the poor in certain well-chosen localities.

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In order to carry out these objects it will probably be necessary to ask for the co-operation of all the branches of the British Medical Association; to assist in the formation of branches of the Society in all the great centres of the population; to endeavour to enlist in the service large bodies of workpeople and trades-unionists; and to appoint lecturers who would deliver simple "health-lectures" on subjects likely to improve the general health of the population.

INTRA-MEDULLARY TUMOUR OF THE SPINAL CORD.

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The following is an abstract of notes on the pathological condition of the spinal cord, and of the clinical symptoms, in a case of unilateral intra-medullary tumour, which presented several points of interest:—

Jane M., aged 41, married, was admitted as an in-patient, on account of paraplegia, at the Manchester Royal Infirmary, on March 20, under the care of Dr. Graham Steell, to whose kindness I am indebted for the opportunity of making the pathological examination of the cord, and of reporting the case.

Previous History.—About three months previous to admission, whilst getting through a half-opened window, the patient "twisted" her back and struck it against the bottom of the window sash. The part hurt was the dorsal region, and the pain was so severe that she fainted at the time; but she soon recovered, and felt quite well for a few days. Then she began to suffer from pain in the back, which continued more or less until admission. At times the pain has been *very severe*. It has been situated *chiefly* "between the shoulders." Sometimes there has been pain in the lumbar region also. A girdle sensation was noticed about two weeks before admission, and also a sensation of "numbness" in the legs. Loss of power in the legs developed on March 16. Two days later bladder symptoms first appeared. A definite history of syphilis was not obtained, but it was exceedingly probable that the patient had been exposed to the risks of syphilis.

On admission the patient was unable to perform any movement of the legs. There was no localised wasting of the legs, and no rigidity. The knee jerks and plantar reflexes were present, but there was no ankle-clonus. There was no pain in the legs, and no tenderness of the muscles. There was *complete* anæsthesia of the right leg, but *only partial* anæsthesia of the left. The firm touch of a pin's head was not felt on the

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right leg; also a deep pin prick was not felt on the right leg. On the *left* leg a fairly firm touch with a pin's head was felt; also a pin prick, if fairly deep, was felt; but neither was localised correctly. The patient could distinguish between the head and point of a pin on the *left* leg, if fairly firm contact were made. The head and point of a pin were not felt on the lower half of the abdomen, but both were felt about 1½ inch above the umbilicus. The abdominal and epigastric reflexes were absent. There was retention of urine, with dribbling, and it was necessary to use the catheter twice daily. There was also loss of control over the motions. The arms and cranial nerves were not affected. There was tenderness on percussion of the spine from the fourth to the seventh dorsal vertebra, but there was no spinal curvature. Rhonchi were heard over the greater part of both sides of the chest. Heart, normal.

March 25. Tenderness in the region of the sixth dorsal vertebral spine.

April 4. Urine contained a large quantity of pus. Slight plantar reflexes were obtained on both sides. The knee jerk was present on the right side; absent on the left. There was no ankle clonus.

April 15. Right knee jerk exceedingly feeble; left, absent. No ankle clonus. Plantar reflexes present. No rigidity of the legs. Marked anæsthesia to tactile and painful impressions on *both* legs. The breathing gradually became more difficult. The pulse became more rapid, and numerous small râles were heard on both sides of the chest.

April 17. Pulse, 132; respiration, 34; temperature, 101°. Death occurred on April 20.

Treatment.—Antisyphilitic from the first; spirits of ammonia and senega; and afterwards chlorodyne, etc., for the bronchitic symptoms and complications.

Autopsy.—Heart somewhat soft and flabby. Pleuritic adhesions and bronchitis on both sides. Pneumonic consolidation of the lowest lobe of the right lung. Abdominal organs presented no changes of importance. The spinal cord was distinctly soft and gelatinous in appearance about the level of the eighth dorsal vertebra. The membranes were normal to the naked eye.

The spinal cord was hardened in Müller's fluid. Naked eye examination showed, on section, a pale diseased area in the lower dorsal region, chiefly on the left side. This region was cut into small blocks, which were embedded in celloidin. Sections were stained according to Weigert's method, also with logwood and aniline blue-black. On the left side of the cord was an area of myelitis, having a longitudinal extent of nearly one inch. It involved the white matter of the cord in the lateral region,

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and also the grey matter on the left side. At one point, about the middle of the longitudinal extent of the myelitis, was a small tumour about the size of a small pea, which involved the left posterior horn of grey matter and the adjacent white matter of the lateral column (see Fig. 1). The tumour could be seen distinctly with the naked eye on section of the cord. Microscopically, it consisted of amorphous caseous material, and was surrounded by a broad capsule of fibrous tissue; also a tract of fibrous tissue ran across the caseous material, as shown in the diagram. No giant cells, or other cell structure, could be seen within the caseous portion of the tumour. The zone of myelitis around the fibrous capsule was studded with numerous greatly dilated blood vessels,

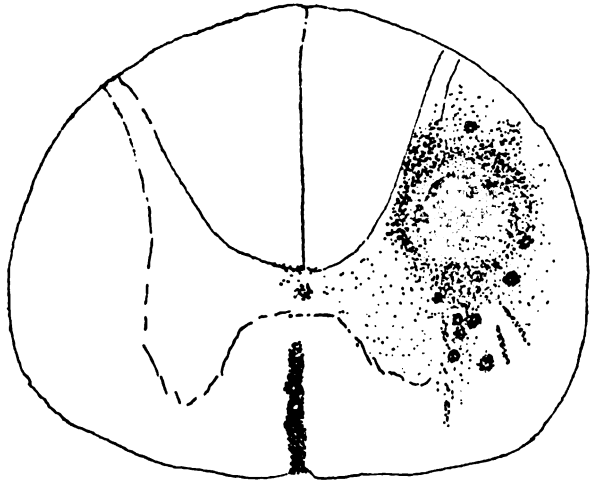

FIG. 1.—Transverse Section of the Spinal Cord showing the position of the Gummatous Tumour and the surrounding Myelitis.

and infiltrated with compound granular cells and leucocytes. At one point the myelitis extended across the commissure and invaded the grey matter of the right half of the cord; also at one point the myelitis on the left side extended forwards in the white matter, just in front of the grey anterior horn, up to the anterior surface of the cord.

When sections of the tumour were treated with dilute hydrochloric acid and ferrocyanide of potassium, no signs of iron-containing granules could be detected. The pathological diagnosis rested between a small syphilitic gumma and a solitary tubercle of the cord. There were no tubercles in any other part of the body, whilst there was a strong probability of exposure to the risks of syphilis, and the microscopical appearance was more in favour of a gumma than of tubercle; also in

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the pia mater the arteries in many sections showed well-marked endo-arteritis, and the adventitia was infiltrated with round cells (see Fig. 2). Some of the small veins presented endophlebitis, but the changes were not so marked as in the arteries. The walls of the smallest vessel were thickened both in the cord and in the meninges, and the vessels were surrounded by a zone of cell infiltration. The vascular changes in the meninges were best marked near the posterior nerve roots. Above the gumma there were well-marked tracts of ascending secondary degeneration in the posterior columns, and below it tracts of descending degeneration in the lateral columns.

Cases of intra-medullary tumour or gumma of the spinal cord, verified by post-mortem examination, are somewhat rare, and the symptomatology of the case recorded above presents several points of interest. The presence of pain for ten weeks before the onset of the numbness in the legs and paralysis was a point of diagnostic importance; so also was the steady progress of symptoms, and the fact that the anæsthesia at first was complete on one leg and only partial on the other.

FIG. 2.—Section of Small Meningeal Artery showing Marked Endoarteritis.

The diagnosis between intra-medullary and extra-medullary (or meningeal) spinal tumours is a point of great practical importance, since the brilliant results of Professor Horsley and others have shown that meningeal tumours may sometimes be successfully removed by surgical operation. One point of importance in the differential diagnosis is pain. In meningeal tumours, pain and symptoms due to implication of nerve roots are severe, whilst in intra-medullary tumours, pain is slight or absent. But to this rule there is one exception, of which the case above forms an interesting example. Dr. Gowers* points out that if a growth *within* the cord should begin in the neighbourhood of the *posterior horn*, then pain may be pronounced. The history of the case which I have recorded bears out this statement. Pain was the most prominent symptom for ten weeks; at times it was very severe, yet the growth was within the cord; but, as seen by Fig. 1, it involved the left *posterior horn* of grey matter.

* "Diseases of the Nervous System," Vol. I., p. 553. London. 1892. Second Edition.

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Many physiologists now believe that the sensory fibres, on entering the spinal cord, do *not* cross directly to the opposite side, as was formerly taught. The view appears to be gaining ground that the sensory fibres, on entering the spinal cord, pass upwards on the same side;* and Brown-Sequard, in one of the last papers which he published (*Archives de Physiologie*, 1894, Tome V., p. 196), mentioned the results of experiments on animals, which had led him to abandon his previous views as to the crossing of sensory fibres in the cord. Whatever may be the exact course of sensory fibres, in the majority of unilateral lesions of the cord in man, as Brown-Sequard points out, there has been anæsthesia on the side *opposite* to the lesion, and motor paralysis on the same side as the lesion. Hence he still maintained that this clinical group of symptoms, to which he first drew attention—paralysis of one side and anæsthesia of the opposite side—was indicative of a unilateral lesion of the spinal cord.

In the case reported above, the tumour growth was distinctly limited to the left half of the cord, but at the time of the autopsy (as shown by the microscopical examination) the myelitis around the tumour had involved the grey matter of both sides. It is interesting to note, however, that when the patient first came under observation, there was *complete* anæsthesia on the side *opposite* to the tumour, and only partial anæsthesia on the side of the growth.

The motor symptoms were bilateral when the patient first came under observation, and probably had been bilateral almost from the time they were first noticed. The sensory symptoms very rapidly became equally marked on both sides. This point has been often noticed, *i.e.*, that if a tumour be situated *within* the spinal cord, the symptoms are either bilateral from the first, or, if unilateral at the onset, they more rapidly become bilateral than in cases of meningeal tumour.

THE TREATMENT OF ACUTE PYOSALPINX BY INCISION AND DRAINAGE, WITH NOTES OF TWO CASES.

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The management of acute pelvic inflammation is a subject of extreme importance, and the cases, as met with in practice, often present great difficulty. It is now well known that the large majority of purulent collections in the pelvis have their origin in the Fallopian tubes,

* See Mott (*Trans. Royal Soc.*, 1892); also Turner (*Brain*, 1891, Part LVI.).

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commencing as a purulent salpingitis, which may lead to an intra-peritoneal collection of serum or pus, or may form a pyosalpinx. It is, however, by no means easy in many instances to diagnose with certainty the presence of pus during the course of an acute attack. Many cases with severe symptoms recover entirely, or become chronic, resulting in the formation of inflammatory swellings at the sides of the uterus. On the other hand, we meet with cases in which, associated with pyrexia and the general signs of infection, a well-defined mass is discoverable in the region of the Fallopian tubes, on one or both sides of the pelvis, and in these cases the presence of pus may be diagnosed with a considerable degree of certainty. If the patient's life does not appear to be threatened by the continuance of the inflammation it is generally agreed that operation should be postponed until the acute attack has subsided. Sometimes, however, the symptoms, often coming on acutely, are so grave that if no interference is decided upon, a fatal termination will ensue either from general peritonitis or septic poisoning. In these cases the best treatment to pursue becomes a matter of anxious consideration. Abdominal section for the removal of inflamed or suppurating appendages during an acute attack is attended by a very high mortality. There are several reasons for this. In the first place the general condition of the patient is usually not such as to withstand a prolonged and difficult operation, and secondly, in removing the pus sacs and separating the adhesions an escape of pus into the peritoneal cavity is very liable to occur, and as this pus generally contains virulent organisms fatal peritonitis may ensue. The removal of a pyosalpinx and suppurating ovary through the vagina has been performed many times with great success, but in acute cases a radical operation of this nature cannot be undertaken with any degree of safety.

These cases may, however, be cured by incising and draining the pyosalpinx through an incision in the posterior *cul-de-sac*, and there is no doubt that this is the most suitable treatment. This is by no means a new operation, and probably many cases of pelvic abscess evacuated per vaginam have been instances of pyosalpinx in which the pus sac has become attached to the vaginal wall. Vaginal incision has, however, usually been reserved for cases in which the swelling was situated low down in Douglas' pouch and obviously adherent to the roof of the vagina, and it has not been considered advisable to operate in this way on pus sacs lying high up in the pelvis.

In 1891 Henrotin* strongly recommended this plan of treatment, and recorded twenty-seven cases of acute pelvic inflammation in which the posterior *cul-de-sac* had been opened by a semilunar incision. The

* *Trans. Amer. Gyn. Soc.*, Vol. XX., 1895.

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finger was now introduced, and the inflammatory mass explored. In the majority of cases one or more collections of pus were found and evacuated. The cavity was now packed with gauze, which provided for drainage. This procedure was followed in all the cases by very satisfactory results. Dr. Henrotin recommended that the uterus should also be curetted at the same time with the object of destroying any focus of infection in the cavity.

Recently M. Monod,† in a paper on "The Treatment of Suppurative Salpingitis by Vaginal Incision," has given details of twenty-five cases. In the great majority of these a permanent cure was effected by this procedure. He points out that in many of the cases, on opening the posterior *cul-de-sac*, a collection of serum or pus is at once evacuated. This is really a perisalpingitic collection, and it is always necessary to explore further to ascertain the condition of the tube itself. This will usually be found to be distended with pus, which must be freely evacuated, otherwise a cure cannot be anticipated. M. Monod considers the operation specially suitable for cases of unilateral suppuration in the tube or ovary, especially if of recent origin. Many of the cases, however, treated by him are not operated upon in the acute stage, but this plan of treatment was adopted at a later period in place of removal of the diseased appendages.

Jacobs‡ has treated eight cases of pyosalpinx by incision and drainage, but his results were not satisfactory. One patient died, and in six others the disease was not cured, and it was necessary to perform a more radical operation. H. Kelly* has adopted this treatment for acute cases, and found that eight out of fifteen recovered entirely without further operation.

The two cases in which I have performed this operation were instances of acute pelvic inflammation of recent origin, in which the condition of the patient at the time of operation was exceedingly grave. In Case 1, after incising and draining a right pyosalpinx, it was necessary a week later to open the wound and drain the left tube. In Case 2 the pyosalpinx was very large, containing eight ounces of pus, and was unilateral. It is interesting to note that the pus in each instance contained virulent micro-organisms. In Case 1 streptococcus pyogenes and staphylococci; in Case 2 bacillus pyocyaneus in pure culture.

The result in each case was entirely satisfactory. The patients had immediate relief to the symptoms and made a perfect recovery. The notes of the cases are as follows:—

† *La Gynacologie*, July, 1898. ‡ *Brit. Med. Journ.*, August, 1898.

* "Operative Gynecology," Vol. II., p. 222.

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Case 1.—Mrs. A., æt. 32, married four years. She had one child three years ago, and since this time had not felt well. She first consulted me in January, 1896, and complained of dragging pain in the abdomen, and sacralgia with leucorrhœa and profuse menstruation. I found she had a mobile retroflexion of the uterus, with chronic endometritis. The appendages were apparently normal. She was treated by tampons, followed by the application of a Hodge pessary. This gave great relief, and she was able to carry on her household duties. I again saw the patient in October, 1896. The symptoms had during the last few weeks become aggravated, and she had severe iliac and hypogastric pains. The uterus had again become retroflexed, and, in addition, a distended Fallopian tube could be plainly felt on each side of the fundus uteri. The swellings were tense, mobile, and elastic, and the condition appeared to be one of double hydrosalpinx. She was advised to have absolute rest in bed. A fortnight later I was asked by my friend, Dr. Macdonald, to see the patient at her home. She was evidently extremely ill. The temperature for some days had varied between 101 deg. and 104 deg., and she had had several rigors. The pulse was 130 at the time of my visit. The abdomen was distended and exquisitely tender. The tongue was dry and she had bilious vomiting. Examination per vaginam showed the uterus to be firmly fixed, and behind it, on the right side, was felt a slightly movable mass, high up in the pelvis, and very tender to touch. From the history it was evident that this was a pyosalpinx setting up general peritonitis. I advised immediate operation. Dr. Macdonald kindly gave chloroform, and Douglas' pouch was freely opened. A few ounces of seropurulent fluid escaped. On introducing two fingers the right Fallopian tube was plainly felt, as a fluctuating swelling. It was evidently adherent to the coils of bowel and omentum superiorly, and it did not appear to be advisable to attempt to enucleate the sac. I therefore opened it freely with scissors, and about four ounces of pus were evacuated. The finger introduced through the opening broke down several septa. The cavity was gently flushed out with saline solution and a double drainage-tube inserted. The immediate effect of the operation was excellent. The temperature fell to normal and the signs of peritonitis subsided.

A week later, however, I was again summoned to see the case. All the severe symptoms had recurred, associated with intense pain in the left side of the pelvis. I found that an elastic swelling now filled up the left half of the pelvis. Evidently the left tube had become infected. I therefore opened up the wound and similarly incised and drained the left tube. The right tube had now so much diminished in size and the discharge was so scanty that I removed the drainage-tube from that side. The patient gradually improved, but developed an attack of acute endocarditis, which we feared might be infective. In three weeks, however, she was practically convalescent, and made a good recovery.

Bacteriological examination of the pus by cultures on gelatine and glycerine agar revealed streptococcus pyogenes; also staphylococcus pyogenes albus and aureus.

Since this time the patient has been practically well. I examined her in May, 1898. She did not complain of any special pain. Menstruation was almost painless and normal in amount. The uterus was retroverted and partially fixed by peritoneal adhesions. The appendages were small, and

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though some peritoneal bands were felt on each side, no pain was complained of during examination. She had no discharge beyond slight leucorrhœa.*

Case 2.—Mrs. C., æt. 28, had always enjoyed good health until after marriage. She then had an attack of pelvic inflammation, which was probably gonorrhœal in its origin, and since then she had at times suffered from slight iliac pains, especially at the menstrual periods. In August, 1897, she had a natural labour, being delivered of a premature child. Ten days later she had a severe attack of pelvic inflammation, and I was asked to see her in the early part of September of last year. She was then evidently suffering from severe pelvic peritonitis. The right leg was drawn up. The abdomen showed slight general distension and was very tender in the right iliac region, where a distinct swelling could be detected. The temperature varied from 101 to 103 deg. Pulse, 100 to 110. The tongue was dry in the centre and she had frequent vomiting.

Per vaginam, the uterus was pushed to the front, and the right side of the pelvis was filled up by a tense, rounded swelling, slightly mobile, situated about the level of the pelvic brim and reaching considerably above it. For some days expectant treatment was adopted without any improvement. A week later she became suddenly much worse. The temperature rose to 104·6 with a rigor, and she had frequent bilious vomiting. Pulse, 120 to 130. Operation was clearly indicated. The patient was placed under ether by my friend, Mr. Smith. The posterior *cul-de-sac* was freely opened. On introducing the fingers the swelling was found to be a very large pyosalpinx, evidently adherent to the bowel above, and extending up into the abdominal cavity. The lower surface of the swelling was separated from its adhesions, and it was then freely opened with scissors. Eight or ten ounces of pus were evacuated. The finger introduced showed it to be a thin-walled sac, with several septa, and probably the ovary was also involved. The cavity was flushed out and a double drainage-tube inserted. Sterilised gauze was placed in the floor of the pelvis around the tube. The appendages on the left side were examined, but were not obviously enlarged. The after-progress of the case was perfectly satisfactory. The temperature fell to normal in 36 hours, and the pains rapidly subsided. The cavity was syringed out daily for a week, and the tubes removed at the end of ten days.

Bacteriological examination of the pus was made by cultures of glycerine agar, and a pure growth was obtained of bacillus pyocyaneus. No other organisms could be isolated.

Three months later I examined the patient. She was feeling perfectly well; much better than before the operation. Menstruation was normal and accompanied by little pain. There was no discharge. The uterus was anteverted and mobile. The right appendages were not clearly felt, as there appeared to be peritoneal adhesions round them. The left tube and ovary were normal.

The treatment of pyosalpinx by vaginal incision and drainage, in place of complete removal of the tube and ovary, is an operation which is still upon its trial, and further observations are needed, more especially with regard to the permanent results. It is most likely to

* Since writing the above, this patient has again consulted me on account of some return of pain in the region of the left appendages. There is no obvious tumour; but the left ovary is tender and lying low, so that it is possible that a further operation may still be necessary.

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be satisfactory in acute cases, when it is necessary to operate for urgent symptoms. In the chronic cases, often of tubo-ovarian abscess, with numerous foci of pus in the ovary, it is hardly likely to be so successful, although good results have been recorded.

The exact condition of the tubes is often very difficult or even impossible to ascertain during an acute attack. Sometimes it is found, on opening the posterior *cul-de-sac*, that an intraperitoneal abscess is alone present. Thus in one case I found, on exposing the *cul-de-sac*, a retro-uterine abscess containing four ounces of pus. The tubes and ovaries, though covered with purulent lymph, were not obviously enlarged. The abscess cavity was gently flushed and a drainage tube inserted. The patient made a rapid and complete recovery.

I believe, then, that in vaginal incision followed by drainage we have a valuable method of treating acute cases of pyosalpinx, and that in many cases this procedure will be followed by complete cure. Immediate relief is always afforded, and if recovery is incomplete a further operation may be undertaken later when the case has become chronic.

With regard to the technique of the operation, the essential points appear to me to be as follows:—

(1) The incision in the posterior *cul-de-sac* must be free enough to admit two or three fingers and to allow a careful examination of the swelling. In a certain number of cases the vaginal incision is immediately followed by the escape of serous or purulent fluid. It is essential, however, to examine further the condition of the Fallopian tube, which in most of these cases contains pus.

(2) A free opening must be made in the distended tube. This may be done by passing a pair of forceps into the sac, and then enlarging the opening with the fingers or scissors.

(3) A finger should be passed into the pus cavity, and any septa gently broken down.

(4) A large-sized drainage tube should be inserted, or, better still, two tubes, which may be sewn together at the end, thus allowing fluid to be injected without any risk of over-distending or rupturing the sac.

(5) It is probably wise to syringe out the cavity daily with some non-irritating fluid.

(6) The tube should be retained until the discharge has become very slight or ceased altogether.

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FRACTURE OF THE ATLAS AND AXIS, WITH CRUSHING OF THE SPINAL CORD: A CASE IN WHICH LIFE WAS PROLONGED FOR THREE AND A HALF HOURS BY ARTIFICIAL RESPIRATION.

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THOMAS Mc.M——, æt. 47, cab-driver, was admitted to the Manchester Royal Infirmary at 12-15 a.m., December 27th, 1892. He was brought into the accident room by a constable, who stated that he saw the patient standing on the box of his cab, apparently under the influence of drink, in Piccadilly, opposite the Infirmary. A moment afterwards, hearing a noise, the officer turned round, and saw the patient lying in a heap close to the footpath, and in front of the wheel of the cab. His head was strongly flexed under his body. He was at once put into the cab and driven round quickly to the Infirmary, and was thus seen within four minutes of the accident. Patient was a tall, strongly-built, heavy man, with a shortish, thick neck. He was unconscious—face livid and cyanosed. The only external injury was a scalp wound on the right forehead, two and a half inches long, running antero-posteriorly, and opening up the sub-aponeurotic space. There was no sign of respiration, and the radial pulse was absent. On auscultation the heart was found to be beating feebly. Artificial respiration was at once commenced by Sylvester's method, hot sponges were applied over the chest, and 40 minims of ether injected subcutaneously. The phrenics were stimulated by the application of the faradic current during each artificial inspiratory movement. After the lapse of ten minutes the cyanosis of the face disappeared, the corneal reflex became marked, and the pupils moderately contracted. The radial pulse-beat was now full and strong, though somewhat slow. The artificial respiration was now stopped for a short time, but it was found that the patient made no attempt whatever at natural respiration; the face rapidly became cyanosed again, the pulse began to fail, and the patient to lapse into his former condition. Artificial respiration was then resumed, and was continued, except at momentary intervals, until death occurred, three hours later. It having been decided to wash out the stomach, very considerable difficulty was experienced in passing

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the stomach tube into the œsophagus, but having ultimately been passed, the contents of the stomach were found to be clear and odourless. About an hour later, on being spoken to, the patient was found to be conscious, and had possibly been so for some time. On being asked, "What is your name?" the patient repeated the question, "What is my name?" and on being asked a second time said "Tom.," and subsequently gave his surname. He also muttered other words, which could not be distinctly understood, owing to the continuous interruptions by each artificial inspiratory movement. Patient opened and shut his eyes, moved his eyeballs about—in fact, motion and sensation in the face were normal, whilst the whole of the body below the neck was completely paralysed, all voluntary motion and sensation being absent. The knee-jerk could not be obtained. If artificial respiration was stopped for a short time, an attempt at respiration was now made, which consisted only of a spasmodic depression of the lower jaw and angle of the mouth, dilatation of the nares, and protrusion of the tongue. A much greater range of movement than normal was found to exist between the head and the neck, and on gently moving the head from side to side very distinct crepitus was obtained. On introducing the finger into the mouth a hard prominence was felt pressing forward the soft palate and almost obstructing the entrance to the pharynx. It was apparent that this was the body of the axis displaced forwards and downwards, and on gently extending the head on the neck the prominence to some extent disappeared. After two and a half hours had elapsed the general condition began to be manifestly worse; the thorax gradually became rigid, making artificial respiration more and more difficult to carry out. A constantly decreasing quantity of air thus entered the lungs until, about 3-45 a.m., three and a half hours after admission, compression of the chest wall became impossible. During this last half hour some œdema of the limbs was observed, the tongue was dry and swollen, and the patient lapsed into unconsciousness. The corneal reflex gradually disappeared, and was absent for some minutes before the pupils finally dilated. The heart gave an occasional beat for some minutes after the pupils had dilated and artificial respiration had been abandoned. Temperature in rectum half an hour before death was below 95 deg.

Post-mortem.—On removing the brain a large quantity of fluid blood escaped from the subdural space. The cervical spine was removed *en masse*, and at once hardened in spirit. It was dissected some months later, when the following condition was found:—

(1) The odontoid process, together with the upper third of the body of the axis, is separated from the remainder of the body by a somewhat curved line of fracture extending from the inside of the

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superior articular facet on each side; the odontoid process is kept in normal relationship to the atlas, the transverse ligament being intact.

(2) The atlas is fractured in three places, the anterior arch being broken across on each side of the tubercle, and the posterior arch on the right side, just behind the groove for the vertebral artery; the lateral masses are only kept in position by the unruptured transverse ligament. The abnormal movement which could be brought about before death was evidently effected through the fractured body of the axis, the segment above the fracture consisting of the comminuted atlas, the odontoid, and upper part of the body of the axis, all held together by the transverse ligament, can be made to slide backwards and forwards on the lower segment to the extent of five-eighths of an inch in each direction. The cord having been exposed by removing the laminæ of the vertebræ from behind, the meninges are found to be unruptured. On opening the dura posteriorly and dissecting the pia mater from the cord, the nerve matter of the cord is seen to be pulped, and is almost completely divided at the level of the fracture of the body of the axis, the posterior columns being the only portion remaining intact.

The chief point of interest in this case lies in the fact that, owing to the patient having been brought under observation immediately after the infliction of the injury, life was prolonged for some hours by artificial respiration, though the spinal cord was almost completely severed just below the medulla. In looking over the literature of injuries of the upper end of the spinal column we have been unable to find a similar case to this. In all cases where the spinal cord has been lacerated at its junction with the medulla, whether occurring through accident or by judicial hanging, death has been practically instantaneous. In a case of fracture through the base of the odontoid process recorded by Mr. Frederick Eve the line of fracture of the axis was very similar to that found in the present case, but there was no fracture of the atlas, and the cord, though nipped and ecchymosed, was not lacerated. The patient lived two and a half hours, and during that time respiration was carried on by the action of the sterno-mastoids, sternohyoids, and sternothyroids—the latter acting from the hyoid bone as their fixed point. Mr. Eve thinks that there must also have been feeble action of the diaphragm, although no movement of the abdomen on respiration could be observed. In the present case there was no action of any of these muscles. The conducting paths to the phrenics and the spinal portion of the spinal accessory nerves must have been entirely destroyed. The only muscles which contracted during the attempts at respiration were those supplied by cranial nerves—the muscles of mastication, the facial muscles, and the platysma.

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Mr. Eve has collected eleven cases of fracture of the axis besides the one which came under his observation. In one only was death instantaneous, whilst complete recovery occurred in two. Paralysis supervened immediately in three cases, and after an interval in six, whilst it was altogether absent in two. Mr. Eve points out that paralysis is "a less frequent or, at any rate, not so immediate a symptom as in fractures or dislocations of the spine lower down. The large amount of room allowed for the cord by the posterior arch of the atlas permits a considerable displacement before it is seriously compressed." In five cases the atlas also was fractured, in one of which, recorded by McCarthy, it was broken into five pieces. There was, however, no displacement or evidence of compression of the cord.

Mr. S. Buckley records a case in which a child of seven, who was in hospital for bronchitis, died suddenly on being slapped on the back to ease a fit of choking caused by tea entering the glottis when the patient was laughing. A prevertebral abscess was found, and the odontoid, which was partly eaten through by caries, had snapped off at its base. The atlas was displaced forwards and pressed on the cord, which, with its membranes, presented a healthy appearance.

Dr. W. W. Gibson records a case where a man, æt. 58, rolled one hundred yards down a steep bank. After lying unconscious all night he was assisted home. A dislocation forwards of the atlas was felt and reduced, but recurred on the 23rd day on the patient sitting up in bed, and he died immediately. The odontoid and a portion of the body of the axis were found broken off. The cord was not injured, but had a small indentation in front which corresponded to the jagged edge of the body of the axis. The atlas was not fractured.

Lawson records a case of fracture of the body of the axis, followed by recovery, with death ten years afterwards from another disease, when the body of the axis was found ankylosed to that of the third cervical vertebra and bent backwards.

In a case recorded by C. S. Wallace the odontoid process and left superior facet of the axis were separated from the lower part of the body. The patient, a middle-aged man, fell nine feet, and after a a period of unconsciousness was able to walk into hospital. His head protruded forwards, the chin nearly touching the sternum. There was a slight projection on the posterior pharyngeal wall opposite the hard palate. On the eighth day flexion and rotation of the head had returned to an almost normal extent. On the same day, whilst the drawsheet of his bed was being changed, he was suddenly seized with violent dyspnœa, and died within three minutes of asphyxia. The transverse ligament was found intact, and there was no apparent damage to the spinal cord.

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In a case of Gurling's, quoted in Professor Dixon Mann's "Manual of Medical Jurisprudence," death did not ensue for twenty-eight hours after fracture of the first three cervical vertebræ, although the cord was injured at the level of the third vertebra. Here respiration must have been carried on mainly by the sternomastoids and depressors of the hyoid bone, as in Eve's case; but it is also to be noted that in an injury to the cord at the level of the third cervical vertebra the third cervical pair of nerves, and probably, at any rate, the upper fibres of origin of the fourth would be intact. As the phrenic nerves arise chiefly from the fourth pair, and commonly have a branch of origin from the third, a partial action of the diaphragm would doubtless persist after an injury at this level.

The present case is also of some interest in the light it throws on the mode of death in severe injuries of the nerve centres. It would *a priori* be expected that instantaneous death from paralysis of the vital centres in the medulla would follow such a severe shock to the central nervous system as that arising from the crushing of the cord just below the medulla. In the majority of cases of judicial hanging, which, as carried out at present in this country, produces fracture-dislocations of the upper three vertebræ, particularly the axis, with severing of the cord at the level of the axis, immediate death does probably occur in this way. In the present instance the primary shock, intense as it must have been, did not cause death, which was about to supervene from asphyxia when the artificial respiration was commenced. It is possible that in judicial hanging death may sometimes be due to secondary asphyxia rather than the primary nerve shock.

The patient's condition during the time between the accident and death was one of great interest. It was, indeed, startling to find a man conscious, and for a time able to articulate, yet in whom all spinal impulses were cut off from the brain by the injuries sustained. He may be said to have had no independent existence, and during the first two hours of artificial respiration the question was discussed as to how long it should be continued, or whether we should be justified in stopping it and allowing the patient to die. It was decided to continue it until his wife, who had been sent for, should arrive. By that time, however, the general condition had so far deteriorated that it was evident that nature was intervening to decide the question. The gradual onset of rigidity of the thoracic wall, the increasing difficulty with which air was made to enter the chest, and the occurrence of the subcutaneous œdema—with doubtless also œdema of the lungs and other viscera—are points worthy of note.

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NOTES FROM THE POST-MORTEM ROOM:

AN ANALYSIS OF SEVENTY CASES OF CEREBRAL HÆMORRHAGE.

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CEREBRAL hæmorrhage presents so many features of pathological and medico-legal interest, that we venture to think that an analysis of cases recently investigated in the Pathological Department of the Manchester Royal Infirmary may not be without value. It may be as well at the outset to clearly point out that we are dealing solely with cases of hæmorrhage into the cerebrum. Meningeal hæmorrhages and hæmorrhages into the pons, medulla, and cerebellum are not included in the present analysis.

Number and Proportion of Cases.—Among 1,642 cases of all kinds examined during recent years, 70 examples of intra-cerebral hæmorrhage

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have been met with. This gives a percentage of 4·26 as occurring among all cases submitted to a pathological examination in the Manchester Royal Infirmary.

Sex.—The relative proportion of cases is shown in the following table :—

Sex.	No. of Cases.	Percentage.
Male	54	77·14
Female	16	22·86
Total	70	100·00

Age.—In 7 cases the exact age was not ascertained, the patient being described merely as "middle-aged," "elderly," and so on. In the remaining 63 cases our analysis gives the following results :—

	No. of Cases.	Age.
Average age, both sexes	63	50
Average age, males	48	48
Highest age, males	48	76
Lowest age, males	48	15
Average age, females	15	54
Highest age, females	15	72
Lowest age, females	15	38

These numbers show that the female cases averaged over 5 years older than the males. The age distribution was as follows :—

Age.	No. of Cases.	Percentage.
Under 30 years	3	4·76
Between 30 and 39 years	9	14·29
„ 40 „ 49 „	18	28·57
„ 50 „ 59 „	16	25·40
„ 60 „ 69 „	12	19·04
„ 70 „ 79 „	5	7·94

It is interesting to note that the 3 cases under 30 years of age were all males, while of the 9 cases between 30 and 39 only two were females.

Etiology.—The two most common causes were atheroma and granular kidney; in 26 of the cases both conditions were present, whilst of the remaining 44 cases, atheroma was found in 21 and granular kidney in 11. Thus, in 58 out of 70 cases (82·85 per cent), one or both of these causes was present. The exact figures are as follows :—

Nature of Lesion.	No. of Cases.	Percentage.
Atheroma	21	30·00
Granular kidney	11	15·72
Atheroma and granular kidney	26	37·14
Malignant endocarditis	6	8·57
Syphilis	1	1·43
Obscure	5	7·14
Total	70	100·00

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In addition to the above syphilitic case, syphilis was probably also present in one of the cases of granular kidney.

In 3 cases there was a history of gout, and in 2 cases there had been symptoms of plumbism.

In only 2 cases was there a distinct history of violent exertion at the time of the onset. One of these occurred during a fight; while in the other case—a boy of 19—in which the hæmorrhage was preceded by acute gastric pain and vomiting after indulgence in a pork pie and a cigar, the kidneys and blood vessels were normal, and nothing definite was found to account for the lesion.

In addition to the above causes, there was in 40 cases, or over 57 per cent, some hypertrophy of the left ventricle, this being very marked in 17 of the cases.

Etiology in Relation to Age.—With a view to showing the relation of the most important etiological factors to age, we have arranged the following table :—

Hæmorrhage associated with	No. of Cases.	Average Age.
Malignant endocarditis	6	34·66
Granular kidney	11	46·36
Atheroma	18	54·22
Granular kidney and atheroma	22	57·18
Atheroma, granular kidney, or both	51	53·82

Thus, while the average age in the cases associated with granular kidney is a good deal lower than in those with atheroma, when the two are both present it is again considerably higher. There were no cases of atheroma, granular kidney, or cardiac hypertrophy under 30 years of age, and only three between the ages of 30 and 39.

Situation of Lesion.—With regard to the site of the hæmorhage, we have analysed our cases with a view to indicate the side and also the exact seat as far as could be ascertained. The results are indicated in the following tables :—

(*a*) Side Affected.

Side.	No. of Cases.	Percentage.
Left	37	56·07
Right	27	40·90
Both	2	3·03

Taking only the 51 cases where the basal ganglia or internal capsule were involved, we get the following results :—

Side.	No. of Cases.	Percentage.
Left	31	60·78
Right	19	37·25
Both	1	1·97

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(*b*) SEAT IN CEREBRUM.

Seat of Lesion.	No. of Cases.	Percentage.
Basal ganglia or internal capsule	51	76·11
Intra-ventricular	5	7·46
Temporo-sphenoidal lobe	4	5·97
Frontal lobe	2	2·98
Occipital lobe	2	2·98
Parietal lobe	1	1·50
Double hæmorrhage (parietal lobe and internal capsule)	1	1·50
Small multiple hæmorrhages	1	1·50
Total	67	100·00

We may also mention that in exactly half the cases the blood had burst into the lateral or other ventricles.

Associated Lesions.—These have been to some extent referred to when considering the etiological factors. We have already pointed out that well-marked hypertrophy of the heart was present in 40, or over 57 per cent, of the cases.

In all the cases associated with malignant endocarditis the disease affected the left side of the heart. In several other cases old valvular disease or fatty degeneration of the heart was found.

"Large white kidney" was present in one case.

In 5 cases (8·57 per cent) there was evidence of a previous hæmorrhage in the form of an old blood cyst. In one case this was situated in the right lenticular nucleus, the fatal hæmorrhage destroying the left basal ganglia. In another case, where the old cyst was found in the right anterior frontal region, the recent hæmorrhage was situated in the left basal ganglia. In the remaining cases three of the cysts were present in the pons and one in the cerebellum. One of the former was a particularly interesting case, the patient, a man, æt. 56, having been in the Manchester Royal Infirmary for several months, suffering from multiple neuritis; after death, in addition to the hæmorrhage which caused death, there were several old hæmorrhagic cysts in the pons, with secondary descending degeneration in the medulla oblongata.

Secondary Conditions.—In almost all the cases there was more or less engorgement of the viscera, particularly of the lungs. In a few there was bronchitis or broncho-pneumonia.

Another very constant feature was congestion and œdema of the meninges. In a number of other cases there were hæmorrhages in the membranes, and in one or two into the pons or tegmentum.

In two of the cases associated with malignant endocarditis there was infarction of the spleen.

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Clinical Features.—It has been almost impossible to obtain anything like a reliable history of the onset and special symptoms of most of the cases. In the majority the invasion seems to have been sudden and unexpected. In some the subject was known to have chronic renal disease, but in a large number of the cases the hæmorrhage occurred in persons carrying on their ordinary avocations. In not a few cases the hæmorrhage occurred after being turned out of a public-house at night, or while under the influence of alcohol. We have already referred to the two cases in which the patient was undergoing violent exercise at the time of onset.

In several cases the fatal hæmorrhage took place while the patient was in hospital with malignant endocarditis. A good number of cases were found unconscious in the streets, and admitted to hospital in a comatose condition. Several were brought in dead. In at least one case there was a history of a blow on the head.

The symptoms noted at the outset naturally varied with the associated conditions. In one case, where the hæmorrhage occurred during an attack of malignant endocarditis, there had been purpuric manifestations during the previous six weeks. Many of the other points of interest have already been dealt with in considering the etiology and the associated conditions.

It has been impossible, under the circumstances, to obtain reliable data in regard to the temperature in every case, but in many cases a very considerable rise was recorded. In a large number the temperature rose to 104° or 105°, and in two cases to over 106°. In others the temperature fell below the normal. In one case the onset was accompanied by gastric pain, vomiting, and collapse, and the temperature was as low as 95°; later on it rose to 106°, death taking place on the ninth day.

We wish particularly to refer to the duration of life after the onset of the hæmorrhage. In 7 cases this could not be ascertained, but our analysis of the remaining 63 gives the following result :—

Duration of Life.	No. of Cases.	Percentage.
Death within 24 hours	29	46·03
„ on the second day	9	14·29
„ on the third day	5	7·93
„ during rest of first week	8	12·70
„ after first week	12	19·05

It may be said that the duration of life does not appear to depend necessarily upon the *extent* of the lesion. Many of the cases, in which there was a comparatively small hæmorrhage in a previously healthy person, ended fatally within 24 hours, while others, where there was extensive

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destruction of the brain, survived many days. Thus, in one case there was an enormous hæmorrhage in the right frontal lobe, compressing and causing softening of the basal ganglia and internal capsule, but death did not occur until the tenth day. In another, a man, æt. 63, the internal capsule and basal ganglia of the left side were destroyed, but the patient lived for twenty days. In the majority of cases, however, where the patient survived more than a week, the lesion was not very extensive. On the other hand, the *situation* of the lesion does not seem to have any perceptible effect upon the duration of life.

Conclusions.—From a consideration of these 70 cases, we arrive at the following conclusions :—

(1) Hæmorrhage into the cerebrum occurs in a little over 4 per cent of all fatal cases examined at the Manchester Royal Infirmary.

(2) It occurs much more frequently in the male sex. The exact percentage is 77·14 males and 22·86 females, or in the proportion roughly of 3½ males to 1 female.

(3) The age varies from 15 to 76, but averages 50·26. The average age of males is 48·93, and that of females 54·53.

(4) The clinical features are somewhat variable, but are generally sudden in onset and characterised by rapidly-developing unconsciousness.

(5) An atheromatous state of the vessels is the most frequent etiological factor present. Atheroma, granular kidney, or both of these conditions, were noted in no less than 82·85 per cent of the cases. Cardiac hypertrophy was present in 57 per cent.

(6) The age varies according to the nature of the lesion leading to the rupture of the vessel. The highest average—57·18 years—is reached in atheroma and granular kidney, but in hæmorrhage associated with malignant endocarditis it is only 34·6 years.

(7) The right hemisphere was the seat of the hæmorrhage in 40·90 per cent of the cases, the left in 56·07, while both sides were affected in 3·03 per cent. In no less than 76·11 per cent the lesion was situated in the basal ganglia and internal capsule.

(8) The commonest secondary conditions are of a pulmonary and vascular nature.

(9) The duration of life after the occurrence of the hæmorrhage varies from a few minutes to nearly three weeks, nearly 70 per cent ending fatally in the first three days. The duration depends to some extent upon the seat of the lesion, but not so much as might be expected.

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Clinic.

CASES OF ABDOMINAL SURGERY.

By E. STANMORE BISHOP, F.R.C.S. (Eng.), Hon. Surgeon, Ancoats Hospital.

Case 1.—Ureteral calculus. Removal by suprapubic lithotomy. Death.

Mrs. R., æt. 35, married 13 years, no children, no miscarriages. Sent by Dr. Knapton, Manchester. Menstruation commenced at 15 years, always regular up to last July, when both tubes and ovaries were removed by another surgeon.

Has complained of pain in left iliac region as long as she can remember. This was especially severe between 13 and 15 years of age. This has become more continuous since marriage. Since the operation she was easier for five weeks, whilst lying in bed, but the pain returned before getting up, and since that time the pain has been as severe and its recurrences more frequent.

When a paroxysm comes on, it starts below the left costal edge in front. It may remain there, in which case it is bearable: sometimes it passes downwards in an oblique direction to the symphysis, shooting in that direction and down the left leg, then upwards again to a point behind, and below the tip of the 11th rib, when it becomes atrocious.

At 22 years of age she was in the Bradford Infirmary, with suppression of urine. She underwent some operation, the nature of which is uncertain, which relieved her for several weeks.

Before pain begins the amount of urine becomes scanty, passing, however, until the pain becomes severe. During the intenser period there is constant desire to urinate, with much straining. Sometimes a few drops will be passed with intense pain. When pain disappears urine is passed almost simultaneously. Sometimes she was afraid to urinate for fear of the return of pain; then, after an attack, she would pass it three or four times in the course of half an hour. There was no burning in the urethra during or after the passage of urine. Since last July she has been about a month between attacks, latterly about a fortnight. Five weeks since she had a longer and more severe attack than any before. A week ago she had a very long, but not so acute, an attack. This lasted three days, and required large repeated doses of morphia.

The pain is most severe over the left ovarian region; Jordan Lloyd's test causes stabbing pain in left renal region, none on right side.

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Pain used to pass off in the dorsal position, but does not do so now. The easiest position at present is on the back; the most painful, the right lateral.

Urine is slightly acid, and contains small amount of albumen, hæmo- and leucocytes, with crystals of calcium oxalate.

Uterus is small, movable, and somewhat drawn to left side. Nothing could be felt bimanually from the vagina. With the finger in the rectum, a hard mass, the size of a hazel nut, could be felt at the base of the bladder in the line of the ureter, somewhat movable laterally, but otherwise fixed.

March 30th, 1898.—The urethra being dilated, under chloroform, the finger was introduced into the bladder, and the tip of the stone felt projecting from the left ureter. The patient was placed in the Trendelenburg position and suprapubic cystotomy performed. When the bladder was opened, the ureter was divided sufficiently at its extremity to allow the stone to be shelled out. The stone weighed 100 grains. The bladder was then united by catgut sutures and the abdominal wall closed. Complete relief followed for a time, but suppression of urine came on, and the patient died on the third day. No post mortem was obtainable.

Case 2.—Double pyosalpinx. Fibroid uterus. Combined vaginal and abdominal section. Recovery.

Mrs. J. A. C., æt. 46, two children, both "fine young men"; no miscarriages. Was quite well up to birth of second child, 21 years ago, after which she was not convalescent for two months. For seven or eight years after she suffered from sacral and hypogastric pain, which was relieved by a pessary. Two years later this broke, and being in poor circumstances she did not replace it. Then she began to fell something enlarging inside. Fourteen months ago she became much worse, and has been confined to bed more or less ever since.

Patient is a thin, worn-looking woman, with a face which shows long-continued pain. Menstruation is profuse, and irregular as to time of occurrence, and the amount lost at each time is increasing. Vaginal examination shows a split cervix with glandular hypertrophy. The uterus is enlarged and retroflexed; two fibroids are felt per rectum in the posterior wall. Behind and on either side are two firm, fixed, elastic masses. The temperature is irregular, rising at night.

Operation was begun in the lithotomy position. Bladder separated off with some difficulty. Douglas' pouch could not be found. The uterine anterior wall was split for some distance, the peritoneum being opened in front, but it was found impossible to bring the fundus down. One vessel spouted from the split surface. This is said not to occur.

Patient turned into the Trendelenburg position, and abdomen

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opened from the front. The uterus was found embedded in adhesions to omentum, small intestine, and with two large, firmly-adherent tubes and cystic ovaries, both containing purulent fluid. Douglas' pouch was obliterated by adhesive peritonitis to a level one inch below the fundus uteri. After removal, patient was much collapsed, and no attempt was made to close the peritoneum below. A gauze drain was placed in the vagina; some vessels were left with clamps still attached through the vagina. The abdominal wall was closed in the usual way.

The patient slowly recovered, after a very anxious period, due to persistence of shock and vomiting.

Case 3.—Recurrent appendicitis. Removal of appendix during interval. Recovery.

Mr. W., æt. 20, unmarried. In June, 1897, pain was first felt in the abdomen early one morning. This gradually became worse towards night. There was no apparent cause. No previous strain, exposure, or improper diet. The pain was at first general all over the abdomen, but by night on the first day it had become localised in the right iliac region. Dulness on percussion was also found by that time in this situation. He remained in bed for 14 days, and was absent from business for six weeks on this occasion. From time to time up to the following Christmas he had occasional momentary pain, but since Christmas was perfectly well until May 5th, 1898, when general pain all over abdomen appeared again soon after dinner. The next day there was dulness above the right Poupart's ligament, extending about one inch upwards and inwards. On May 10th there was slight delirium, but this disappeared on the 11th. The dulness gradually disappeared. The patient was confined to the house for fifteen days, and then went to the seaside for a week.

June 2nd.—Trendelenburg position. Vertical incision just inside Langenbuch's line, opening the sheath of the rectus on the right side, extending from a point half an inch above Poupart's ligament to the level of a line passing from the umbilicus to the anterior superior spine of the ileum.

On opening the peritoneum the omentum, greatly thickened, was found adherent in the right iliac fossa and to the brim of the pelvis; slightly also to the colon. There was one pretty strong adhesion extending from the tip of the shrunken and adherent appendix to the pelvic wall. The appendix itself was at first difficult to find. It existed, as a small, thickened hard lump, at the end of the anterior longitudinal band of the colon, firmly adherent to the angle between the ileum and the cæcum; when dissected out it became longer and more evidently the structure in question. It was ligatured at its base with fine silk, and the stump invaginated into the cæcum, the peri-

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toneum of which was united over it by four fine Lembert sutures. Some oozing vessels in the omentum were tied, and the latter reduced. The pelvis was sponged out. No drainage. Abdominal wall united by triple suture. The skin wound covered by celloidin.

June 12th.— The patient has had nothing special to record. Vomiting for about two hours after the anæsthetic, slight. Bowels moved on third day. Celloidin is loose to-day, and is removed with skin sutures. Primary union. Left surgical home on 21st, well.

Case 4.—Endometritis. Split cervix. Retroflexio uteri. Curetting. Emmet's operation on cervix. Ventrofixation. Recovery.

Mrs. W., æt. 30, married, three children; no miscarriages.

First child born 8¼ years ago. Tedious labour; no instruments; remained in bed 14 days. On getting up, flooded, and had to go to bed again for seven days.

Has suffered from piles since girlhood. A severe attack when 20 years old, another between first and second child, confining her to bed for a fortnight, and several attacks at intervals since.

Second child 6¼ years ago; nothing abnormal.

Third child 4¾ years since, after which she complained of much suffering, the pain being mainly about the anus. This lasted four or five days. Was in bed 14 days.

Three months later her husband suffered from quinzy, and, whilst she was suckling, she had the main work of nursing him, which she found very exhausting. She has never been well since. She has had three attacks of influenza, the last just after her husband's illness. Began to complain of prolapse soon after; has become much worse during the last eighteen months. A pessary was introduced by her medical attendant, and was worn for six months. This gave her support, but caused much pain, and interfered with defæcation, the patient passing several days without an action. The bowels had always been somewhat constipated, but she had never previously required an enema; has always needed one since. The first pessary was removed and a smaller one introduced, but this did not keep its place. This was, however, worn on and off for some three months, when a soft glycerine ring was substituted. This came away every time the bowels were costive. Since the extra exertion consequent upon her husband's illness, at every period she loses a large amount of blood during the first two days, then there is an interval of two days, followed by a moderate flow for two days more. Last period, just over, was continuous for one week.

Four months ago had great pain in abdomen over and around umbilicus. This was associated with diarrhœa, tenesmus, the passage of small clots with mucus per anum, and reappearance of piles. A week

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after there was another slighter attack. Complains of a painful spot on the left side midway between the umbilicus and anterior iliac spine, which is tender on pressure. Has felt this, more or less, for ten months, and constantly for the last week. Complains also greatly of sacral pain.

June 6th.—Per vaginam. Relaxed outlet; slight rectocele and cystocele. Os split deeply on both sides. Glandular hypertrophy of os. Fundus tender, somewhat enlarged, flexed posteriorly, but not adherent. Muco-purulent exudation from os. Slight vaginitis. For some days after admission constant vaginal douches were given, the uterus being replaced daily with the sound, and the patient encouraged to spend most of her time lying upon her face and in the knee-chest position. The pain was easy in these positions, but returned on resumption of the dorsal position. The uterus, also, always was found once more retroflexed.

June 10th.—Uterus dilated, curetted. Mopped out with Churchill's iodine. Iodoform wick drain.

June 25th.—All discharge from the interior of the uterus having ceased, the split cervix was pared and united by four silkworm sutures on either side. Iodoform wick drain. An attempt was then made on the left side to find the round ligament, but this was not successful, so ventral fixation was done with two silk sutures passed through the uterine wall below the fundus. The sutures also passed through the parietal peritoneum and the muscular wall on either side. The abdominal wall was closed by triple suturing, and sealed by celloidin. No drainage. Light packing of gauze in vagina. She had a good deal of pain, requiring two ¼-grain morphia suppositories the same night. This did not recur. Flatus and stool passed on the third day. Urine passed naturally from the first. The wound healed per primam, except at one point, where some blood had accumulated between the lips of the wound. This produced no reaction, but was evacuated on the fifth day, and the little cavity between the skin and muscular layer was filled with iodoform gauze.

July 13th.—All sutures were removed. The cavity was quite filled up.

July 20th.—Discharged well. Period just over; normal; no leucorrhœa following.

The first case has some points of interest. Utereral calculi impacted in the vesical orifice of the size removed are rare. *A priori*, one would expect that they would be easily felt bimanually with the finger in the vaginal fornix, which would come directly over this spot. In this case, however, it could not be so felt, but became at once evident to the finger in the rectum: another proof, if one were needed, of the advisability of routine examination by this passage.

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That the symptoms exhibited misled another surgeon into the removal of both ovaries and tubes may appear curious, unless it is remembered that all the symptoms were greatly aggravated at the menstrual periods, owing, doubtless, to the increased congestion and consequent pressure upon the tender structures at such times. The surgeon himself expressed his conviction that the tissues he removed were themselves diseased, but, failing a detailed account of the changes noted, not so far forthcoming, no opinion on this point can be given. The fact that the symptoms complained of dated back to a period before that of the commencement of menstruation suggested another cause than disease of those organs.

The absence of a post-mortem examination renders the actual cause of death doubtful. Whether other calculi were washed down and occluded afresh the re-opened ureter, and their irritation produced reflex inhibition of the opposite kidney, or whether both ureters became blocked at once, or whether the operation itself induced suppression, cannot be certainly determined.

The second case raises the question of vaginal versus abdominal section in the treatment of pyosalpinx. In this case a combination of the two appeared advisable. I hope later to publish a more extended review of this subject.

CHRONICLE.

Medicine.

UNDER THE CHARGE OF JULIUS DRESCHFELD, M.D., F.R.C.P.

ROTMANN (F.). "Untersuchungen über den Zuckergehalt pathologischer Flüssigkeiten."—*Münchener med. Woch.*, Feb. 8, 1898.

THE author has made a large number of analyses of transudations and exudations in order to ascertain whether the statement of Senator is correct, that usually these fluids in non-diabetic subjects are either free from sugar or only contain traces thereof. He was much surprised to find that the dropsical fluid in anasarca contained 0·1 per cent of sugar. It had been previously pointed out, however, by Bock (1873) that the dropsical fluid in anasarca contained a copper-reducing substance which was regarded as sugar. Eichhorst in 1881 found a similar substance in pleuritic exudation. Other cases have also been recorded, but as a rule the evidence of grape sugar has been based simply on the reduction of a

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copper solution. Recently, however, it has been shown that in lymph, as well as in transudations, a reducing substance is present which is not grape sugar.

Observations made by the author two years ago showed that Senator's statement (above mentioned) was not correct. The author has also shown that both serous transudation and exudation give a distinct reaction for sugar, and that the reaction is useless in distinguishing between chylous and chyloid fluids.

Rotmann has examined 110 puncture fluids from 78 patients. These fluids consisted not only of transudations and exudations from the large serous cavities (pleura, peritoneum, pericardium), but also of the dropsical fluid in anasarca, cerebro-spinal fluid, arthritic effusion, the fluid from cystic tumours, bullæ of the skin, abscesses, and almost all kinds of pathological fluids.

Nearly all of these fluids contain a large amount of albumen, which it is advisable to remove by Pascheles and Reichel's modification of Seegen's method (see *Wiener med. Woch.*, 1896, No. 17). The clear filtered fluid is then tested for sugar.

In Rotmann's analysis the fluid was tested with Fehling's solution, and if a reducing substance was present a quantitative estimation was made. The rest of the fluid was then evaporated to $\frac{1}{5}$ or $\frac{1}{10}$ of its volume, and tested for sugar by the Almén-Nylander's test, the phenyl-hydrazin test, and by fermentation in Einhorn's saccharimeter. After fermentation the solution must be filtered and again tested for reducing substances.

With the exception of one case, sugar was always absent from the urine.

Rotmann's results were as follows :—

(1) *Effusion in the Peritoneal Cavity.*—Twenty specimens, obtained from ten patients. With the exception of the sero-purulent fluids, sugar was always present, from 0·055—0·109 per cent, average 0·085. The highest percentage was in cirrhosis of the liver; the lowest in tubercular peritonitis.

(1*a*) In four cases of ordinary hydrocele, the fluid contained from 0·07—0·1 per cent of sugar. In one case of spermatocele no sugar could be detected in the fluid.

(2) *Effusions into the Pleural Cavities.*—Thirty-one specimens from 23 patients. Of these, 18 were serous fluids, and all contained sugar from 0·032—0·093 per cent, average 0·064 per cent. In 9 specimens of fluid from cases of empyæma sugar was absent 6 times. In 3 specimens from 1 case sugar was found, but the patient had suffered from diabetes mellitus, and when the empyæma had developed the sugar had disappeared from the urine.

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In a recent case of hæmothorax sugar was detected in the fluid, whilst in an old case it could not be detected.

(3) *Pericardial Effusions.*—Three specimens. Two specimens were serous (tubercular cases), and sugar was present in both, 0·045—0·63 per cent, whilst in a case of purulent effusion sugar was absent.

(4) *Anasarcal Fluid.*—Seventeen specimens from 7 patients. In all cases sugar was present. In 13 specimens obtained during the life of the patient the sugar averaged 0·099 per cent.

(5) *Skin Vesicles.*—In 8 specimens from 8 patients sugar was always present. In 3 cases, due to burns, the amount was 0·1 per cent. In 4, due to the action of cantharides, the amount was 0·029 per cent. Sugar was also present in the fluid from a vesicle in a case of pemphigus.

(6) *Cerebro-Spinal Fluid.*—Six specimens from 5 patients. The fluid was obtained by lumbar puncture. In 2 cases the patients suffered from chronic hydrocephalus, and in 4 from tubercular meningitis. All contained sugar.

(7) *Arthritic Effusion.*—Twelve specimens from 10 patients. In 4 hæmorrhagic effusions sugar was present; in 2 sero-purulent effusions it was absent.

(8) *Cystic Tumours.*—In the fluid from 1 case (nature of cyst unknown) sugar was absent. In the fluid from a cystic tumour in the pouch of Douglas sugar was absent.

(9) *Abscesses.*—Six cases. Sugar was absent from the purulent fluid of all six cases.

The above observations show that all serous transudations and exudations, even in non-diabetic patients, contain a small amount of sugar. That the reducing substance is sugar is proved by the phenyl-hydrazin and fermentation tests.

These observations also show that the reducing substance in cerebro-spinal fluid is sugar, and not some other reducing body, as has been often stated.

In marked contrast to the serous effusions stand the sero-purulent or purulent fluids. In non-diabetic patients they never contain sugar.

Pickardt (M.). "On the chemistry of pathological effusions."—*Berliner klin. Wochenschrift*, 1897, No. 39; *Centralblatt f. innere Med.*, No. 35, 1898.

In 20 specimens of pathological effusions the average amount of albumen was 2·4 per cent in ascitic fluid, 0·7 per cent in œdematous fluid, and 5·3 per cent in pleuritic effusion. Uric acid, with one exception, was always present. 0·0078 per cent of uric acid was found; *i.e.*, the percentage was greater than that of normal mammalian blood.

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Sugar was present in all cases. The test for sugar was carried out immediately after the fluid was removed from the body. The author points out that it is important to examine for sugar directly the fluid is withdrawn. In cases of ascites he found 0·06 per cent, in pleuritic effusion 0·05 per cent, in œdema 0·126 per cent. In 9 out of 20 specimens examined with the polarimeter rotation to the left was found, and all these cases gave the Seliwanoroff's reaction for levulose.

Runeberg (J. W.). "On the diagnostic importance of the amount of albumen in pathological transudations and exudations."—*Berliner klinische Wochenschrift*, 1897, No. 33, and *Centralblatt f. innere Med.*, No. 35, 1898.

Little diagnostic importance has been attached to the percentage of albumen in pathological fluid, because the same percentage has been found in various diseases, and, on the other hand, different percentages have been found in one and the same affection; also the estimation of the amount of albumen is troublesome and complicated.

According to the author, the percentage of albumen in a pathological fluid is not, *per se*, pathognomonic, but it is a sign which, taken along with others, is an aid to diagnosis. The following is the percentage in pathological effusions from various causes:—

(1) Inflammatory processes, 4 to 6 per cent of albumen.

(2) Venous stasis, 1 to 3 per cent of albumen.

(3) Marked hydræmic conditions, as in amyloid degeneration or nephritis, 0·1 to 0·3 to 0·5 per cent.

(4) Combination of two or three of the above causes, 0·2 to 6 per cent.

In the second group, even when no inflammatory complication occurs, a high percentage may occur in old transudations when the pressure is high or when absorption is taking place.

The percentage of the fourth group causes the greatest difficulty in diagnosis, as many complications may arise.

The author employs the following method for estimating the amount of albumen:—A few drops of nitric acid are allowed to fall into the fluid in a test tube. In the first group of cases (above mentioned) heavy flakes are produced, and a thick precipitate forms at the bottom of the glass; in the second group large, loose, abundant flakes are formed, which usually sink to the bottom; in the third group only small, loose flakes are produced, and these float in the fluid; in the fourth group doubtful cases can only be tested by the use of Paykull's method. On the addition of a few drops of acetic acid to an inflammatory exudation a more or less marked turbidity arises, whilst in non-inflammatory fluids it is absent or very slight.

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NAWRATZKI. "On cerebro-spinal fluid."—*Zeitschrift f. physiol. Chemie*, Band XXIII., p. 532; *Centralblatt f. innere Med.*, No. 35.

FROM the examination of the cerebro-spinal fluid of the calf and horse, and of a number of patients who suffered from general paralysis, the author has shown that the reducing substance which it contains has the chemical properties of grape sugar (as shown by the production of glucosazon). The presence of pyrokatechin, to which Halliburton has attributed the reducing power of the fluid, could not be proved. Human cerebro-spinal fluid was found to contain 0·0468—0·1696 per cent of albumen and 0·0555 per cent of sugar. Cerebro-spinal fluid removed from the body a few hours after death has no longer any reducing power, or, at least, has only a very slight reducing power.

WULLENWEBER (H.). "On central softening of the spinal cord in syphilitic meningitis."—*Münchener med. Wochenschrift*, August 9th, 1898.

THE author reports an interesting spinal case, in which post-mortem examination revealed a cavity in the cord, evidently secondary to a syphilitic meningitis.

The patient was a woman, aged 28, who had previously suffered from syphilis. The illness commenced with pain in the back (lumbar region). This was followed by headache, and then by weakness and rigidity of the legs. The patellar reflexes disappeared. At a later date painful spasmodic contractions often occurred in the right leg, and later still girdle pains became very troublesome. The legs finally became atrophied and completely paralysed, and bedsores and paralysis of the sphincter developed.

Pathological examination of the spinal cord revealed a central cavity, extending from the lower lumbar to the upper cervical regions. The cavity was localised to the grey matter. There was marked syphilitic meningitis and syphilitic diseases of the blood vessels. The case was not one of true syringomyelia: the cavity was apparently due to a necrosis of the spinal cord, caused by syphilitic disease of the vessels. The symptoms and clinical course also were not those of syringomyelia.

Experiments on animals have shown that necrosis of the grey substance of the spinal cord can be produced by temporary ligature of the aorta, whilst the white substance is able to resist for a longer period.

In Wullenweber's case circulatory disturbances, and the anæmia produced thereby, were the result of marked endoarteritis and of the compression of blood vessels by the cicatricial tissue in the meninges.

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The circulatory disturbances had produced nutritional changes, and these had been followed by the formation of a cavity.

During the last twenty years four cases have been reported in which softening and cavity formation in the spinal cord have been produced by syphilitic meningitis.

Luithleu and Sorgo. "On the staining of ganglion cells."—*Neurologisches Centralblatt*, No. 14, 1898.

Much attention has been recently paid to the staining of the ganglion cells of nervous tissues, and the stain introduced by Nissl has been of great service in the pathological examination of the nervous system. But this staining can only be carried out when the tissues have been hardened by methods which spoil the structures for other stains.

Luithleu and Sorgo, however, have now succeeded in finding a method which can be used whatever may be the mode of hardening. By this method Nissl's granules in the ganglion cells can be detected even when the tissue has been hardened in Müller's fluid.

The following are the details of the process:—

(1) The specimens may be hardened in Müller's fluid, alcohol, or formol.

If Müller's fluid be used, the specimen must be hardened for six or eight weeks, and then washed in a running stream of water for 24 hours.

(2) The specimens are embedded in celloidin, and section made as thin as possible.

(3) The sections are placed in water and then transferred to the staining fluid—*Unna's polychrome methylene blue.* They are allowed to remain in this solution for 24 hours.

(4) The sections are then washed in distilled water for 24 hours.

(5) They are then placed on a slide and dried, and *Unna's glycerine ether* mixture is poured over them (until they show well-marked differentiation of the grey and white matter) for 8—25 seconds, according to the thickness of the sections. The excess of the solution is poured away, and the sections dried with filter paper.

(6) Absolute alcohol is poured over the sections to remove the glycerine ether. The sections are again dried.

(7) The sections are cleaned thoroughly with oil of origanum.

(8) They are mounted in Canada balsam.

[The solutions used—Unna's polychrome methylene blue and Unna's glycerine ether solution—may be obtained from Dr. Grubler, Bayerschestrasse, Leipzig.]

The granules of the nerve cells are stained blue by this method, as in the process of Nissl. *R. T. Williamson.*

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Midwifery and Diseases of Women.

UNDER THE CHARGE OF W. J. SINCLAIR, M.A., M.D.

QUEIREL: Marseilles. "The value of the anti-streptococcic serum."—*Annales de Gynécologie*, May, 1898.

THE author considers serum therapeutics among the most attractive in medicine of the present day. Whilst, however, experiments upon animals can be carried out with toxins and antitoxins with almost mathematical precision, in the practice of medicine we must work largely in the dark, and we must wait for the results of clinical observations. We are not yet in a position to estimate the gravity of any given attack of infection or the import of certain concomitant circumstances; hence we do not know how to compute the dose of an antitoxic serum with which to combat the attack.

Inasmuch as the specific serums act as microbicides in exalting the vitality of the phagocytes, and so placing the organisms in the best possible position to resist the infection, we ought to welcome them in the treatment of the puerperal diseases of which the issue has been almost invariably fatal.

Queirel has employed the serum of Marmorek in seventeen cases of puerperal infection—three times in erysipelas, fourteen times in septicæmia. In speaking of the results, he says: "We have lost only two patients"! In order to estimate the influence of the use of the serum in producing this favourable result, he goes on to examine the history of each case.

Among the cases where the streptococcus must be considered the principal, if not the exclusive, element in the infection, we would expect the antistreptococcic serum to be indicated and to produce the maximum of its results in erysipelas. The following is what the author considers a good illustration: Puerperal erysipelas declared itself on the 22nd day; injection of Marmorek's serum twice, each time to 10 cc.; final fall of the temperature; recovery. This result is such as has been observed after antidiphtheritic injections, or which Chantemesse has seen in over 1,000 cases of erysipelas treated by the serum of Marmorek. In two other cases of puerperal erysipelas, Quierel found that injections of serum did not in any way modify the symptoms or prolong life. One patient died the day after the injections were begun. In these cases of puerperal erysipelas, as well as in all the cases of puerperal septicæmia, the

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author waited until the symptoms were unmistakably declared, and other methods of treatment, including intra-uterine injections, were found powerless to improve the patient's condition or lower the temperature. He reflects: "Perhaps this was a mistake; perhaps it would have been better to employ the serum therapeutics at the onset, or even as a prophylactic when danger was to be feared."

In 13 of the cases reported the temperature was over 104°, in one of them it was over 107° and in 2 cases over 105°, when the serum was first used. Recovery followed in all these 3 cases of high temperature.

A definite and final fall of the temperature was observed in 5 cases after the injection of 20 cc. of the serum; but in others as much as 50, 60, and even 110 cc. of serum was injected in divided doses before any clear result was obtained.

The injections were always given to the extent of 10 cc. or even 20 cc. at a time. Queirel is disposed to the opinion that 20 cc. should be given to begin with, to be followed by similar doses, or by 10 cc. injections, repeated until the definite fall of the temperature. He concludes that there can be no doubt as to the virtue of Marmorek's antistreptococcic serum, but in some cases it is necessary to go on repeating the injections until the definite fall of the temperature. In some cases also it is necessary to aid the action of the antistreptococcic serum by injections into the cellular tissue and rectum of large quantities of artificial serum. It is assumed that the latter not only sustain the strength of the patient, but also enable her to eliminate the powerful toxines.

A summary of the chief incidents in one of the cases will, perhaps, best enable the reader to form his own opinion as to the evidence supplied by the author in support of his conclusions.

A. P., æt. 30. Primipara at full term; presentation transverse; delivery after other manipulations by means of forceps; child living. Laceration of the cervix; inertia of the uterus; manual removal of the placenta, post-partum hæmorrhage *assez forte*. All well until the seventh day, when a slight rigor occurred; temperature, 102·2°. On the eighth day another rigor; temperature, 103·3°. On the ninth day another rigor; the temperature meanwhile had risen to 108°. Immediately after this observation an injection was made consisting of Marmorek's serum in a dose of 10cc. This was repeated the same day. The abdomen was not tender, and the lochia were free from odour; but the temperature remained over 39° C. = 102° + Fahr. Injection of 10cc. serum Marmorek on the following day and day after. Then recurrence of rigor, with temperature 106°. Fresh injection of 10cc. repeated also the next day, with the temperature at 105·5°. Fall of temperature after this sixth injection. It appeared to be final, but

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five days afterwards there was again a rigor, and the temperature rose to 104·3°. For the five days following an injection of 10cc. was given daily, and ultimately the temperature fell to normal, and the patient recovered.

No details are given as to the condition of parts in the pelvis during the three weeks or more covered by the observations, or as to the subsequent history of the patient.

W. J. Sinclair.

BYFORD. "An improvement in the after-treatment of peritoneal section." *American Journal of Obstetrics*, July, 1898.

INTESTINAL paresis or obstruction is, in the author's opinion, an important factor in causing fatal sepsis, for in these cases a very slight infection may develop into a fatal peritonitis, the infection probably finding its way through the stretched intestinal walls.

Great stress is laid upon the danger of exposing the peritoneum and intestinal coils to the air. Raw surfaces are also often left after operation, followed by oozing of serum, and there is no doubt that intestinal adhesions may develop twelve to thirty-six hours after operation, which, if untreated, may end in obstruction and death.

The beneficial effect of the passage of flatus and fæces after abdominal section is well known, and most operators try to obtain an action of the bowels within forty-eight hours after operation.

Dr. Byford has of late years adopted the following method:—

(1) The day before the operation a saline purge is given sufficient to produce several loose stools, and two hours before the operation a mild aperient is given, such as two teaspoonfuls of liquid extract of cascara.

(2) Immediately the patient recovers from the anæsthetic a drachm of sulphate of magnesia is given every hour, and repeated if vomiting occurs.

(3) Six hours later an enema of glycerine (2 oz.) and water (4 oz.) is given, and repeated every three hours until flatus is passed freely.

(4) When flatus and fæces pass freely the administration of aperients and enemas is stopped for a few hours.

Dr. Byford states that since commencing this form of treatment he has been able to do without the administration of morphia, and points to having recently a series of a hundred and five consecutive recoveries of cases treated in this "thorough manner."

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DUDLEY (E. C.). "The value, limitations, and alternatives of topical applications in gynæcology."—*Philadelphia Medical Record*, June, 1898.

THE chief procedures that are adopted in local treatment are—(1) The hot vaginal douche; (2) insertion of tampons; and (3) intra-uterine applications.

Vaginal Douches.—It is of essential importance that these be given with strict attention to detail, otherwise they are useless, and may be harmful. The well-known rules of Emmet are recalled, viz.—(1) The patient must lie on her back with the shoulders low, so that the outlet of the vagina be the highest point. In this way only can the vagina be kept filled with the fluid. (2) It should be given twice daily, for twenty minutes each time. (3) The temperature should be as high as the patient can endure comfortably, 105 deg. to 115 deg., or even higher. (4) Its use must be continued for several weeks or longer. The douche acts in two ways—(1) As a vaso-motor stimulant, causing contraction of dilated and congested vessels, hence producing absorption of morbid products and improving nutrition. (2) As a cleansing agent, especially if pathological discharge from the vagina, uterus, or tubes is present. Hence its chief value is in chronic pelvic inflammation. Doderlein has shown that normally an acid-forming bacillus is present in the vagina which prevents the growth of most (90 per cent) pathogenic bacteria, and thus in a normal vagina the use of a douche by washing out these organisms may be distinctly harmful.

Application of Tampons.—These may be required—(1) *For inflammatory conditions*, as a means of applying pressure, in the treatment of displacements, especially retroflexion. This indication, in the author's opinion is better fulfilled by massage on the Thure-Brandt system. It may also be applied as a vehicle for the introduction of medicaments, such as glycerine and various absorbents, ichthyol, iodine, etc. If used at all, the tampon should be changed daily, as if it remains longer it becomes offensive, and may lead to infection. (2) *For hæmorrhage.*—Occasionally it may be used to check bleeding from the uterine cavity, as in fibroids, or after abortion. This is, however, better controlled by intra-uterine packing with gauze.

Intra-uterine Applications.—Dr. Dudley is of opinion that these applications very rarely cure endometritis by their local effect, since the treatment as ordinarily used does not thoroughly reach the disease. The application, as commonly applied, may also cause wounds of the uterine mucosa, and if rigid asepsis be not adopted infection may be set up. Many cases of discharge from the uterine cavity are the result of some general condition, and may be cured by attention to the general health, no local treatment being necessary (*vide infra*).

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In other cases the principal factor is a local infection with distinct purulent discharge. Here the endometrium is often extensively infiltrated, and the mere application of a mild substance is ineffectual. Cauterisation by chloride of zinc or nitric acid may destroy the diseased surface, but may also permanently damage the delicate epithelium, producing a cirrhotic condition. The beneficial effect of electricity is probably also due to its cauterising effect. Intra-uterine gauze packing has been extensively used for dilatation of the cervix. It is claimed that this acts as a capillary drain. Great care is, however, necessary, as the gauze may readily be the medium for introducing septic organisms.

In the writer's opinion, if infected endometritis and metritis are clearly present, the curette should be used. It has been shown by Werth and others that after thorough scraping with a curette numerous islands of epithelium remain, from which a healthy mucous membrane is formed. Curetting will not cure all cases. In glandular endometritis a cure is usually obtained. If, however, the disease has passed on to the atrophic interstitial form, curetting will not cure, and extirpation may even be required.

Finally, many cases of uterine catarrh are due to constitutional disorders arising from disturbance of the general circulation, such as in disorders of the lungs, heart, liver, or kidneys; also in uric acid and other diatheses, such as anæmia, diabetes, gout, rheumatism, etc.

Some cases, also, are the result of a general infection, as typhoid, scarlatina, or diphtheria. It is probable, also, that constipation may lead to uterine catarrh.

In all these cases the true indication for treatment is attention to the general health.

If, then, the two preceding classes of cases be excluded, the field for topical applications to the endometrium becomes a very limited one. It may be necessary at times, but the greatest attention must be made to details of asepsis.

CHANDELUX. "Torsion of the pedicle in ovarian tumours."—*Soc. de Chir. de Lyon.* (Analy. *La Gynæcologie*, June, 1898.)

FINAZ (A.) "Twist of pedicle of ovarian tumours."—*Sem. Gynæc.*, May 10, 1898.

THE changes met with in the tumour vary according to the severity of the twist. In moderate degrees of torsion the veins of the pedicle become pressed upon more than the arteries, thus still allowing blood to enter the tumour. As a result, rapid increase of the cyst occurs, with raised

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blood tension in the tumour. This is followed by slight hæmorrhage and increase of transudation until the pressure in the cyst approaches that of the arterial tension. This may cause rupture, or be followed by the phenomena of inflammation, ending in suppuration or rupture. If the torsion is very severe, the arteries and veins are both compressed, and from this several results may arise: (1) Progressive ulceration of the pedicle at the point of constriction. This may finally lead to complete separation of the cyst, which floats free in the abdominal cavity, or it may obtain through adhesion enough nutrition to maintain its vitality. (2) Gangrene of the cyst. This is accompanied by acute general peritonitis, and is generally fatal. (3) Gradual shrinking and atrophy of the tumour, which may even finally disappear.

The tumour, if acute torsion be present, shows a hæmorrhagic or pink surface, with a certain amount of surface œdema. This is always accompanied by signs of general peritonitis. Even in early cases, at the time of operation, the serous coat is usually reddened, and shows lymph exudation. Torsion of a cyst may readily bring about intestinal obstruction.

The symptoms usually come on suddenly, with a feeling of something displaced in the abdomen.

The pain is at first localised over the affected ovary, but rapidly becomes general, extending into the loins and down the thigh on the affected side.

Vomiting is an early symptom. At first it is mucous, and later becomes green. Abdominal respiration is suppressed. There is constipation, often almost complete. The face is usually somewhat drawn and pinched. The pulse is small and quick, and the temperature rises one or two degrees. Death may occur from various causes if speedy help be not given. Thus acute peritonitis may ensue, or hæmorrhage into the tumour, which may be followed by rupture.

If the patient survives the acute stage, chronic peritonitis, with the formation of numerous adhesions of the cyst wall to the abdominal viscera, often follows. Sometimes, also, the cyst may suppurate. Intestinal obstruction has been the cause of death in many cases, due to pressure upon or dragging of a loop of bowel.

The *diagnosis* must be made from rupture of the cyst without torsion, acute intestinal obstruction, hæmatocele, hydronephrosis, and peritonitis due to some other cause.

The only *treatment* of this grave accident is by immediate operation for the removal of the tumour so soon as a definite diagnosis can be made. In a few cases, in which the torsion is gradual and the symptoms are subacute, operation may be delayed for a few days.

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Torsion is liable to occur during pregnancy, due to the displacement caused by the enlarging uterus, and cases have been recorded of successful operation at all periods of gestation.

GOTTSCHALK. "The influence of the puerperal period on ovarian cysts." Anal. *L'Obstetrique*, July, 1898.

IT is generally agreed that ovarian tumours should be removed during pregnancy, if discovered at that time. They are, as is well known, likely to cause great difficulty during delivery, and they are further liable to undergo modifications during the puerperium. The principal changes may be (1) the formation of adhesions, the result of slight inflammation due to pressure or bruising of the cyst during labour; (2) torsion of the pedicle; this is specially predisposed to by the rapid alteration in size of the uterus, and consequent diminution of intra-abdominal pressure after delivery; (3) infection of the cyst contents may occur; this generally causes rise of temperature, and, if the cyst has not been recognised, may simulate puerperal infection. Sometimes the cyst may suppurate without any rise of temperature, and then, very suddenly, severe symptoms may arise. Gottschalk records a case of this kind.

The patient, æt. 40, after 13 years' sterility, was delivered of a living child naturally. On the second day she had abdominal pain and symptoms of peritonitis, which, however, rapidly subsided. Nine weeks later she became very ill, with signs of severe general peritonitis. Operation was performed. A cyst of the right ovary was found with strong adhesions to the bowels and parietal peritoneum. The cyst was removed with some difficulty. It contained greenish pus, of fœtid odour, and also in its upper part a quantity of offensive smelling gas.

The pedicle had been twisted twice on its axis, and was formed of the ovarian ligament. There was in addition a localised intra-peritoneal collection of pus at the side of the uterus. The general peritoneum contained ascitic fluid. The patient recovered rapidly. It is interesting to note that the bacillus coli communis was isolated, in pure culture, from the ovarian cyst, whereas in the pelvic abscess, staphylococcus pyogenes albus was alone present. It is debatable which of these organisms was the exciting cause of the suppuration. It is well known, however, that the bacillus coli communis may produce purulent peritonitis and pyosalpinx, and in this case the dense adhesions uniting the cyst to intestine would readily allow the migration of the bacillus.

Arnold W. W. Lea.

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Pharmacology and Therapeutics.

UNDER THE CHARGE OF D. J. LEECH, M.D., D.Sc., F.R.C.P.

HUTCHISON (ROBERT). (1) "Further observations on the chemistry and action of the thyroid gland."—*Journal of Physiology.* Vol. XXIII., No. 3, July, 1898. (2) "The pharmacological action of the thyroid gland."—*British Medical Journal*, July 16, 1898.

MACLENNAN (WILLIAM). "On the treatment of obesity and myxœdema by a new preparation of thyroid ('thyroglandin')."—*British Medical Journal*, July 9, 1898.

IN the *Journal of Physiology* for 1896, Vol. XX., p. 474, Dr. Hutchison recorded the results of some investigations made with regard to the chemistry of the thyroid gland and the nature of its active constituents. He concluded that the thyroid gland contains colloid matter, a small quantity of nucleo-albumen, and extractives. The nucleo-albumen and extractives are unimportant therapeutically; the colloid matter is the active constituent. It is rich in iodine, and also contains the phosphorus of the gland. It may be obtained by extracting finely-chopped fresh sheep's thyroid in the cold with a 5 per cent magnesium sulphate solution or dilute alkali (1 in 1,000 of caustic soda); on acidifying the solution thus obtained with acetic acid, the colloid is precipitated. It yields on digestion with pepsin and hydrochloric acid—(1) Hydrated proteids, albumoses, and peptones; (2) a proteid free substance. The albumoses contain only traces of iodine, but seem to possess some therapeutic properties. The peptones also contain a small amount of iodine. The proteid free substance contains the greater portion of the iodine and all the phosphorus, and is distinctly active. It is identical with the substance which Baumann obtained by boiling the whole of the gland for some hours with 10 per cent of sulphuric acid, and from which thyroiodin is obtained by treating it with rectified spirit, evaporating the alcoholic solution to dryness, dissolving the residue in caustic soda, and precipitating the solution thus obtained with acid. The colloid matter Hutchison regarded as a globulin, not very firmly united to a non-proteid substance containing iodine in firm organic combination, as well as sulphur and phosphorus.

In a paper published in the *British Medical Journal*, January 23, 1897, Hutchison recorded some cases illustrating the influence of the colloid, and urged its employment for therapeutic purposes in place of

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the other forms of thyroid medicaments. He pointed out, however, that its use did not obviate the subjective symptoms, such as headache and pains in the limbs, which are so often complained of by patients using thyroid preparations.

In his "Further Observations on the Chemistry and Action of the Thyroid Glands," Hutchison shows that the proportion of iodine in the colloid matter is by no means uniform, but varies both in specimens prepared from a single gland and in those obtained from the collective product of a large number of glands. In the colloid from a single thyroid lobe of one sheep, for example, he found in one case 0·14 per cent of iodine, and in another 0·23 per cent; from the colloid obtained from the glands of a series of Scotch sheep, 0·460 per cent; but the colloid from the glands of a number of Norfolk and Leicester sheep contained only 0·233 per cent. A specimen prepared by Oppenheimer and Co. contained 0·462 per cent; whilst another, prepared by Burroughs, Welcome, and Co., contained 0·30 per cent. He repeats the statement that of the three products of the artificial digestion of peptone, the albumoses are therapeutically active in a very feeble degree, and adds that the peptones have no influence in the treatment of myxœdema; the proteid free residue and especially the iodothyrin are, he says, very active.

The degree of activity in the products of the digestion of colloid matter is roughly in proportion to the amount of iodine present, but, though this is the case, it has not been found possible to prepare an artificial iodised proteid substance which will influence myxœdema. Iodised albumen prepared artificially possesses none of the activity of the colloid matter. Nor has it been found possible by increasing the iodine in the colloid matter to increase the activity of the latter as a remedy in myxœdema. Whether the addition of iodine to the proteid free body obtained by the digestion of colloid matter will increase its therapeutic power has not yet been determined.

Dr. Hutchison has made some experiments on the influence of the colloid matter on blood pressure and on the heart. He does not find that the intravenous injection of a solution of colloid matter has any influence on either. A fall of blood pressure, indeed, results from the injection of thyroid extract, but it is due to one or more of the organic extractives and, to a less degree, to the presence of mineral salts. Intravenous injection of colloid matter does not produce intravascular clotting.

Dr. Hutchison has made some experimental investigations with regard to the relation of the thyroid to the reproductive organs. He finds that the removal of the ovaries or testicles has no influence upon the result of thyroidectomy, and that ovarian feeding has no curative influence in myxœdema.

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It has been suggested that the cause of the symptoms following removal of the thyroid will be found in some toxic substance affecting specially the nervous system, and Gley states that the toxicity of the urine of dogs is increased after thyroidectomy. Dr. Hutchison, however, has been unable to find any evidence of the presence of a poison in the bile or central nervous system in animals who are suffering from the result of thyroidectomy.

Feeding with a para-thyroid has no effect in myxœdema. The symptoms produced by removal of the thyroid are not delayed or modified by keeping the animal warm continuously after the operation.

In the *British Medical Journal*, July 16th, 1898, Hutchison gives a very able summary of what is known of the pharmacological action of the thyroid gland, and discusses the bearing of this knowledge on its use as a medical agent. One of the most noteworthy effects of thyroid is the increase it causes in the oxidation of the tissues of the body; in its action in this respect it is unique amongst medicinal agents. It influences both the proteid tissue and fat, hence after its administration more urea is eliminated in the urine, more CO_2 by the lungs, and more water by the kidneys. Dr. Hutchison thinks that the elimination of nitrogen, which occurs at the commencement of thyroid feeding, is due to destruction of circulating proteid, and that the fixed proteid tissues are not attacked until the store of fat, the burning up of which is hastened by thyroid administration, has been considerably diminished. In treating obesity by thyroid feeding, he thinks the diet should not be much restricted, and that the nitrogenous matter should be abundantly represented. Thyroid combats the excessive accumulation of fat by increasing metabolism.

A very important part of the thyroid influence is due to its power of hastening on the life history of the cells. Cell division occurs more rapidly, and the cell reaches maturity and passes to old age in a shorter time than normal. The influence the thyroid exerts in myxoedema and in certain skin diseases, such as psoriasis and ichthyosis, is explained by its power of hastening on the delayed growth and course of life of the cells. Dr. Hutchison is inclined to think the amount of normal thyroid secretion in individuals might possibly influence their growth, and may possibly account for the varying conditions of nutrition, and he suggests that the effects sometimes produced by thyroid feeding in diminishing the size of the goître is due to the fact that when thyroid is given there is less demand for the secretion from the gland itself, hence it decreases in size.

In speaking of the effects of thyroid on the circulation of blood, Dr. Hutchison points out the curious fact that during the administration of

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the thyroid the heart's action is always quickened, and palpitation, irregularity, and threatenings of heart failure are sometimes seen, but little influence seems to be produced on the heart of animals by thyroid when it is applied to the isolated or exposed heart, and even when injected into the circulation thyroid itself seems to have very little direct effect. Any lowering in pressure it seems to cause is due to the presence of extractives. He suggests that in thyroid feeding the heart must be acted on secondarily by some substance produced during the increased metabolism which follows its administration. However caused, the influence of thyroid feeding on the heart is so marked that caution is necessary in giving it to patients with cardiac debility, especially in cases of obesity. In health small doses of thyroid produce no effect on the blood. Large doses cause increased destruction of blood cells. In myxœdema the stimulus which thyroid feeding gives to all cell growth is shown in the blood by a rise in the number of the corpuscles.

The active constituent of the thyroid appears to be excreted entirely by the kidney. Some observers have failed to find iodine in the urine of those who are taking thyroid preparations, but Hutchison says he has detected it in the urine of a dog three hours after the administration of one gramme of the colloid matter.

With regard to the preparations of thyroid and their dosage, Dr. Hutchison points out that there is yet no certain proof that the presence of iodine is essential to the activity of the thyroid. Hence, we cannot, as has been suggested, gauge the activity of thyroid preparations by the amount of iodine they contain. Though there is probably a considerable difference in the amount of active ingredient in thyroid glands, the individual inequalities are neutralised when a preparation is made from a large number of glands, and the new thyroid powder of the Pharmacopœia will be almost constant if prepared in fairly large quantities at a time. He thinks that the new official liquor thyroid is as good a preparation as could have been devised, but as he finds that it contains only $4\frac{1}{4}$ per cent of colloid matter he believes the dose recommended (5—15 minims) is too small. It should be, he says, 15—60 minims.

[In the *British Medical Journal*, July 23rd, 1898, Dr. Murray, who devised the form which has been adopted in the Pharmacopœia, expresses the opinion that the dose suggested by Dr. Hutchison is too large. He thinks that 10 minims contain as much thyroid secretion as is daily found and poured into the blood by the healthy gland, and maintains that the dose given in the Pharmacopœia is the right one.]

Dr. Hutchison recommends small doses, frequently repeated, rather than large doses at long intervals. He points out that idiosyncrasy plays a large part in the reaction, the extent of which in any particular case can never be foretold. It is advisable to begin with a small dose,

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and gradually increase it. Some have held that the unpleasant effects of thyroid are due to toxic substances, due to putrefaction contained in the preparation. Others deny this. Hutchison thinks that some of the symptoms of thyroidism—for example, nausea and diarrhœa—may be explained by the presence of toxic products in the preparation employed. He has not seen them since he used perfectly fresh preparations made by himself. On the other hand, he believes that the headache, pains in the limbs, and cardiac symptoms are due to a specific action of the thyroid itself.

MacLennan records three cases of obesity and one of myxœdema, in which he had used a preparation of thyroid (thyroglandin) with success. The case of myxœdema had been treated successfully with raw thyroid, but "almost all the preparations of thyroid" were tried and failed, or were at least less active than the raw gland. Thyroglandin was found equally active, and produced no unpleasant symptoms. The new preparation has been introduced by Mr. E. C. C. Stanford. MacLennan gives a brief account of the method in which it is prepared, and more recently Mr. Stanford, at the meeting of the British Pharmaceutical Conference at Belfast, has given a full account of its production.

The thyroid gland, according to Stanford, contains two principles, iodoglobulin and thyroiodin. To obtain them the thyroid glands are macerated in cold water, the soluble iodoglobulin goes into solution, and may be obtained by evaporation as a dry powder in conjunction with a little saline matter. The residue from the cold water maceration is boiled with a 1 per cent solution of caustic soda, a little fat which deposits on cooling is filtered off, the solution is then neutralised with HCl and evaporated to dryness. The result, which contains the thyroiodin, is mixed with the iodoglobulin, and the mixed powders constitute thyroglandin, which is said to keep well. The dose is from 3—5 grains.

In a criticism of the new preparation which Dr. Hutchison appends to his paper in the *British Medical Journal* of July 16th, 1898, he points out what he considers errors in some of the statements made and in the processes connected with the production of thyroglandin. There are not two iodine-containing compounds in thyroid gland, but one only, the colloid matter; the thyroiodin splits off from this on hydrolysis of the colloid. The processes described in the production of thyroglandin, result, he says, in the compound produced containing the salts and extractives of the gland which are useless. He considers that the thyroglandin is simply an impure form of the colloid.

D. J. Leech.

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RUSSELL (J. W.). "On iodoform in the treatment of phthisis, with an analysis of 123 cases."—*Birmingham Medical Review*, June, 1898.

IN 1894 Dr. Foxwell read a paper on the antiseptic treatment of phthisis, in which he expressed a decided opinion as to the value of iodoform. Since that time Dr. Russell has given this method a trial, treating nearly all his phthisical out-patients with iodoform.

Dr. Russell refers to the difficulties of forming an accurate conclusion as to the effect of a drug in phthisis, especially the well-known tendency of the symptoms of phthisis to undergo variations, independently of treatment. Apart from this, he acknowledges his results are less conclusive than they would otherwise be, owing to his employment of other drugs in addition to iodoform, but he felt it would be unjustifiable to deprive his patients of the certain benefits of cod-liver oil in order to investigate the doubtful advantages of iodoform; in most cases he used the two drugs in combination. The fallacy caused by this he has been able to correct in some degree by comparison with another series of cases treated by other drugs than iodoform along with cod-liver oil.

Dr. Russell has rigorously excluded all cases in which there has seemed to be any possible doubt as to the diagnosis.

He believes that the results possible under out-patient conditions from a really efficient method of treatment must necessarily be very small. He says: "The conditions of life of the ordinary out-patient in Birmingham are bad enough; but when that of semi-starvation is added to them, as it is early in the history of so many phthisical cases, the opportunities for improvement are scarcely existent, and nothing but the slightest degree of improvement is within the bounds of possibility. Hence it would be irrational to demand anything very striking in the way of proof from the results of any line of out-patient treatment, however good it may be, and I should myself instinctively distrust observations which afforded any such definite proof."

At the same time, he thinks the out-patient department is the true field for the investigation of the action of an antiseptic drug in phthisis, as then the admittedly far more important influences of good food, comparatively fresh air, good hygiene and rest, do not come in to invalidate the conclusions.

Dr. Russell has notes of 269 cases of phthisis in which he has administered iodoform. Of these, 114 patients attended for less than a month, and as he considers that time as a limit below which no treatment can be said to have had a fair trial, these have been excluded. Of the remaining cases, 32 have been thrown out on the ground of some small doubt as to the diagnosis.

This leaves 123 cases for analysis. The great majority of these

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cases have been treated with large and rapidly increasing doses of iodoform. Dr. Russell began usually with two grain doses three times daily, and increased by two grains per dose every week until a maximum of ten grains three times a day was reached. Ninety-eight of the 123 patients attended for a total period of over a month, 31 attended for more than 10 weeks, 6 reached a total attendance of over 30 weeks; only 5 failed to reach a maximum dose of 15 grains per diem. He claims, therefore, that his patients have been placed pretty fully under the influence of the drug.

In analysing the cases, Dr. Russell takes five principal lines—namely, alteration in physical signs, occurrence of hæmoptysis, alteration in cough and night sweats, change in weight, and, finally, the subjective feelings of the patients themselves. In each case he has tried to check the results by comparison with a small series of cases treated without iodoform. These amount to 48 in all, and like the iodoform cases, all received cod-liver oil, thus tending to check the fallacy introduced by the administration of the oil along with the iodoform. This series of cases have been treated either with tonics or with creosotal carbonate.

Physical Signs.—There are only 51 cases treated with iodoform in which the notes are available for a statement on this point. In 14 of these, with a total attendance varying from 4 to 18 weeks, the physical signs appeared to remain stationary. In 22 cases there was steady extension of the mischief as shown by physical signs. In the remaining 15 cases there was some improvement, mostly taking the form of a diminution in, or even disappearance of, the moist sounds. In 5 out of the 15 cases in which improvement in the physical signs occurred, the change was of a marked character; and three of the patients gained from 3lbs. to 7lbs. in weight, and showed distinct subjective improvement. The other two, however, lost 1lb. and 2lbs. respectively, and did not seem in any other way the better for the treatment. The results in the cases not treated with iodoform were certainly still more unsatisfactory, for out of the 16 in which the notes are available for the comparison only two patients showed any improvement whatever in the physical signs, and in only one was the change at all marked.

Hæmoptysis.—In the iodoform cases, hæmoptysis occurred one or more times during attendance in 21·1 per cent of the cases. In the cases not taking iodoform, hæmoptysis occurred in 15·7 per cent only; but as the first series contains many more cases of long attendance than the second, probably the advantage in favour of those not treated with iodoform is more apparent than real.

Cough and Night Sweats.—Dr. Russell thinks his notes scarcely confirm the somewhat enthusiastic statements of previous authors as to

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the efficacy of iodoform in this respect. He avoided asking for reports on any particular symptom, "owing to the ineradicable tendency of out-patients to invent, for one's benefit, any symptom whatever, provided their attention has been sufficiently directed towards it." Thus he has reports on the subject of night sweats in only 14 cases. In only one of these was any material improvement reported, but in this the sweating ceased altogether. In two others improvement was at first noted, but it was followed later by a repetition of the complaint.

Seventy-seven of the iodoform patients voluntarily mentioned the cough one or more times in reporting progress, and of these 20·7 per cent admitted some improvement as against 13·3 per cent of the patients treated without iodoform.

Weight.—Probably the most important test of the value of any line of treatment in phthisis lies in the alteration in weight which takes place under its influence. On this point Dr. Russell gives a table comparing the relative changes under iodoform and under other drugs.

Iodoform Cases.		Cases not Treated with Iodoform.	
Gained	39	Gained	14
Lost	50	Lost	27
Stationary	15	Stationary	6

It would appear that, when compared in this manner, the iodoform cases present only a slight superiority, containing 5·3 per cent more gains in weight, and 3·8 per cent fewer losses than their opponents. But on comparing the respective weights of the patients at the end of a fixed period, the iodoform cases show 8·9 per cent more gains, and 11·1 per cent fewer losses than those not so treated—a decidedly better result.

In the iodoform cases in which the patients attended for the longest periods of time the best results were recorded. Out of eighteen patients who attended for over ten weeks 55·5 per cent gained weight and only 27·8 per cent lost; while six out of the eight patients who attended for more than twenty weeks had gained weight at their period of attendance.

Subjective Improvement.—Dr. Russell has expended some labour on this question. He does not believe that the average phthisical out-patient is optimistic in regard to his own condition, but thinks they seem to suffer generally from the most profound depression.

He has been careful not to call attention to the treatment as in any way out of the common, and his enquiries were limited to the one question: "How are you"?

He compares 122 cases treated with iodoform with 45 not so treated.

His tables show a percentage of 28·7 cases of distinct and more or less persistent subjective improvement in the iodoform cases, and exactly the same percentage in the other cases.

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He does not think this accurately expresses the state of affairs, for it does not represent the relative force of the statements in the two cases. By periodically changing the treatment, and noting the effect of the change, he has been able to get testimony strongly in favour of iodoform. In 32 cases, in which the patients admitted no improvement from their previous treatments, 59·4 per cent voluntarily expressed themselves as feeling better for the change, 27·2 per cent giving very strong testimony as to the benefit they experienced. On the other hand, 6·1 per cent fewer patients acknowledged any improvement at all from the alteration from iodoform to other drugs, and only one patient out of seventeen expressed himself in strong terms at all. Dr. Russell quotes the expressions used by some of the patients, indicating a distinct effect of iodoform in improving their general sense of well-being.

Dr. Russell refers to the toxic symptoms which are unfortunately not uncommon. Out of 269 patients treated with the drug, 28 complained at one time or another of the unpleasant taste and smell produced, and 12 of sickness. Two suffered from amblyopia; the details of these cases he has reported in the *Lancet*.

In conclusion, Dr. Russell states his belief that in a certain number of cases better results can be obtained by means of iodoform than by the ordinary tonic and symptomatic line of treatment.

Francis J. H. Coutts.

Diseases of the Ear.

UNDER THE CHARGE OF W. MILLIGAN, M.D.

BURNETT (C. H.). "Does tympanotomy and removal of the incus arrest progressive hardness of hearing?"—*Philadelphia Polyclinic*, July 23, 1898.

IN chronic progressive catarrhal otitis media one of the earliest events is retraction of the membrane and the ossicular chain, with consequent increase of intra-labyrinthine tension. This is followed, sooner or later, by definite organic changes within the labyrinth.

Results obtained after excision of the membrane, the malleus, and the incus have been disappointing, as neither has there been permanent improvement in hearing nor any arrest in the downward progress of such cases. Eight years ago the author suggested tympanotomy and removal of the incus only in such cases. Up to the present he has performed 61 operations, and has found as a result that none of the cases

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have been made worse, and that tinnitus and vertigo have in all cases been relieved or banished. The hearing also has either remained unaltered or has been slightly improved. The question the author raises is: If a patient with very little hearing still retains this little after removal of the incus, and if a patient with a foot of hearing (as in a case cited by the author) not only retains it, but gains hearing permanently after the operation, may we not conclude that tympanotomy and removal of the incus, with consequent liberation of the stapes, arrests progressive hardness of hearing? If the operation arrests progressive hardness of hearing at, say, twelve inches, may it not arrest it at six feet, or even more? It appears to the author that in the innocuous removal of the incus only, and the consequent destruction of the retractive force of the conductors of sound on the stapes and labyrinth, and the diminished intra-labyrinthine pressure, the aurist possesses a means of arresting progressive loss of hearing. For the operation to have any real practical effect, however, it must be performed while there is hearing left, and not when it is practically gone.

Lester (J. C.) and Gomez (V.). "Observations made in the caisson of the New East River bridge as to the effects of compressed air upon the human ear."—*Archiv. of Otology*, Vol. XXVII., No. 1.

In an interesting and elaborate paper upon the above subject the authors submit the following conclusions:—

(1) That for aerial and bone conduction the reaction of the tuning fork is markedly diminished, this being especially true of the higher notes.

(2) That bone conduction is affected to a greater degree than aerial conduction.

(3) That this is due probably to a hyperæsthesia of the labyrinth or some analogous disturbance, the effects of which are more pronounced in the lower portion of the cochlea.

(4) That the hearing power, both for aerial and for bone conduction, is reduced directly in proportion to the atmospheric pressure.

(5) That the lower tone limit was unaffected, being 16 D.V. in all the cases, both before and after entering the caisson.

(6) That there was no lateralisation in Weber's test, it being negative in all the cases before and after entering the caisson.

(7) That the hearing distance for both the whisper and speech was markedly decreased in the caisson.

(8) That certain vowel and consonant sounds are heard with difficulty or not at all.

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(9) That the hearing distances for the watch decreased in all cases in the ratio of nearly one to twenty (1—20).

(10) That the effects of the aforesaid labyrinthine disturbances persist for varying periods in persons not accustomed to the action of compressed air.

(11) That a pressure of half an atmosphere is sufficient to cause depression of the drum membrane.

(12) That a pressure of two atmospheres causes marked disturbance of the drum membrane, accompanied with congestion of the malleolar plexus, and of the membrana flaccida.

(13) That in some cases this depression is sufficient to cause displacement of the ossicular chain and persistent tinnitus.

(14) That in descending into the caisson—while in the "lock"—there is great danger of the drum membrane being ruptured if care is not taken to perform Valsalva's experiment.

(15) That persons suffering with coryza, a slight cold, or congestion of the naso-pharyngeal mucosa, from any cause, should not attempt to enter the caisson.

(16) That this has been found to be equally true of persons who have been accustomed to entering and re-entering the caisson for many years.

(17) That persons affected with chronic ear disease, especially the sclerosing types, must likewise avoid entering the caisson.

(18) That those affected with labyrinthine disease, especially if the semicircular canals are involved, should be cautioned not to enter the caisson, owing to the great danger of vertiginous symptoms occurring while in the "lock."

(19) That the effect on the heart and general circulation is such as to render it dangerous for those with a weakened or diseased circulatory apparatus to enter the "lock" or caisson.

(20) That the action of the heart is accelerated, the radial pulse being increased from seventy or thereabouts to one hundred and twenty beats a minute.

(21) That persons of a hyperæsthetic or neurotic temperament should avoid entering the caisson.

(22) That the compressed air offers sufficient resistance to prevent whistling especially high notes.

(23) That the atmosphere of the caisson, although generally humid, causes dryness of the fauces and all exposed mucous surfaces.

W. Milligan.

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Diseases of the Throat and Nose.

UNDER THE CHARGE OF A. HODGKINSON, M.B., B.Sc.

VAN LEYDEN. "A case of cured sarcoma of the naso-pharyngeal cavity."—*Archives de Laryngologie*, July—August, 1898.

VAN LEYDEN reported a case (Société Néerlandaise d'Otologie, etc., 23 Mai, 1897) of an old man, aged 70, who had been suffering from deafness and difficulty of breathing for ten months. When seen by the author, in addition to these symptoms, it was discovered that he was unable to breathe through the nose, and that he swallowed with some difficulty. Blood-stained pus occasionally issued from the left nostril, and in the centre of the left inferior turbinate body there was an ulcer which bled readily on manipulation. In the naso-pharynx there existed a bluish-red tumour, which had invaded the orifice of the right Eustachian tube and reached to the orifice of the left tube, blocking the choanæ. Microscopic examination showed numerous round and oval cells. As the age of the patient was against any severe operation, the author carried out the removal of the growth by "morcellement," and between the various "sittings" required the patient took Fowler's solution.

Nasal respiration became completely re-established, the hearing improved, and up to the time of publication no recurrence had taken place. The author, finally, drew attention to the value of arsenic in such cases, to the advantage in certain cases of partial removals extended over several sittings, and to the rareness of naso-pharyngeal sarcoma.

SCHEPPEGRELL. "The non-operative treatment of diseases of the upper respiratory passages."—*Laryngoscope*, July, 1898.

THE stigma of "excessive surgery" is probably more justly branded on oto-laryngology and rhinology than upon any other special departments. Scheppegrell believes that the prevailing question which a patient puts to the rhinologist or laryngologist after an examination is "What operation is necessary?" and the author enters a long protest against that attitude of the section of the profession concerned, which has led to a deduction by the public that consultation with the specialist is an invariable preliminary to an operation. In reviewing the subject the

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author has, perhaps, drifted rather far in the direction of non-operation, and his article is inclined to be a paraphrase of the expression, *Noli me tangere.*

The worst excesses, in Scheppegrell's opinion, are committed by those who have taken a short special course in diseases of the upper respiratory tract, and who, returning home with a formidable collection of cauteries, knives, and saws, regard every patient as a possible subject for the virgin steel.

The author believes that we should not, for instance, interfere with a deflected septum, unless the breathing space on the affected side is reduced 50 per cent. Spurs should be left alone, unless they infringe on the opposite tissues, offer marked obstruction, and give rise to reflex disturbances. It is inadvisable to apply the cautery or mineral acids to acute (or sub-acute) attacks of coryza; it is better to spray the nose with a 2 per cent solution of guiacol and quinine. He does not mention whether it is allowable to attempt to cure sub-acute attacks of coryza, which are owing to an underlying chronic condition, by applying the cautery to the latter. In atrophic rhinitis the rhinologist is almost compelled, *nolens volens*, to confine himself to therapeutic measures only. The author approves of cupric electrolysis, of ozone, and of nasal massage for this condition.

Even in the treatment of the accessory sinuses conservatism is not out of place. Acute sinusitis has been shown by Avellis to tend naturally towards cure, and the results of opening the cavities, in the chronic conditions, have not been so entirely successful as to preclude a preliminary trial of non-operative measures. The discovery of pus after successive "diagnostic" punctures of the antrum is possibly, on some occasions, a circumstance *propter* as well as *post-hoc*.

Without distinct indications towards surgical interference, the author thinks faucial and pharyngeal tonsillar hypertrophy should be left alone. Further, the tonsils undergo atrophy as the patient grows older, and operations on these organs are not devoid of danger. But he does not mention what the distinct indications are, and it is possible that some surgeons would argue that the very co-existence of enlarged tonsils and adenoids points to surgical interference, and that the hypertrophied structures may leave behind them indelible effects which cannot be grown out of.

As regards the larynx and pharynx generally, Scheppegrell believes that too much stress is laid upon nasal stenotic conditions as a remote cause for the inflammatory diseases observed; a search for flaws in the diathesis or habits of the patient may result in relieving the nasal organ from the main incubus of blame.

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Lastly, the rhinologist and laryngologist should avoid the mental myopia which results from too constantly regarding the patient solely through the nasal speculum or by means of the laryngeal mirror.

SCHECH. "Laryngitis exudativa."—"*Münch. med. Woch.*, June 28, 1898.

THE term *laryngitis exudativa* includes a series of affections of the laryngeal mucous membrane in which there is exudation with more or less fluid contained in vesicles or bullæ, or in which there is hyperæmia with swelling. In this category occur miliaria, herpes, varicella, variola, foot-and-mouth disease, aphthæ, pemphigus, urticaria, lichen ruber planus, and other diseases. In miliaria there are vesicles on the epiglottis and ary-epiglottic folds, giving rise to the sensation of a foreign body. It may be necessary to employ bromide of potassium with or without the local application of cocaine or eucaine. Herpes very seldom occurs alone in the larynx; there is usually an implication of skin or of mucous membrane, especially that of the oro-pharynx. The pain may be considerable and require cocaine, eucaine, or orthoform. With varicella, deglutition, respiration, and phonation may be affected, especially in children, owing to the smallness of the larynx. In both this disease and variola, tracheotomy or intubation may become necessary. Foot-and-mouth-disease ("stomatitis epidemica") is accompanied by more or less constitutional disturbance and by vesicles in the larynx, which break down into ulcers. Aphthæ sometimes occur in the larynx in asssociation with aphthæ of the mouth or vulva. Pemphigus occasionally forms exudative swellings in the larynx, but the disease is rare in this organ. It may, however, be limited to the larynx, and, as in herpes, relapses may occur; the bullæ very rarely break down into ulcers. The prognosis is unfavourable. Urticaria, on occasion, affects the laryngeal mucous membrane, and the symptoms depend upon its extent. Although a good recovery generally ensues, death may result from asphyxia. The treatment consists in the liberal use of ice, the instillation of cocaine or eucaine, and, in the case of severe dyspnœa, tracheotomy. Lichen ruber planus is more usually observed in the mouth and fauces than in the larynx. There may be little or no discomfort. Arsenic should be given internally, and sublimate and carbolic acid locally. Impetigo herpetiformis, erythema nodosum, and erythema multiforma are rarely observed in the larynx.

Eugene S. Yonge.

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Forensic Medicine and Toxicology.

UNDER THE CHARGE OF J. DIXON MANN, M.D., F.R.C.P.

KÜNNE. "Massenvergiftung durch Dämpfe von rauchender Salpetersäure."—*Deutsche med. Wochenschr*, 1897.

A FIRE broke out in a building in which a large number of carboys of fuming nitric acid were stored, and the men, who endeavoured to extinguish the fire, were exposed to the fumes. The immediate effects were a sensation of tightness in the chest with an irritable cough, and in some nausea, vomiting, and headache. These symptoms quickly passed off, and the men, after the fire was extinguished, remained for a time on watch smoking their pipes and feeling quite well. They then went home and to bed, sleeping soundly for about six hours, when severe symptoms rapidly developed, comprising difficulty of breathing, vomiting, rapid pulse, cyanosis, insensibility and cramps with great restlessness. Two of the men died in a few hours, the rest (eleven) were admitted into hospital and they recovered. It was noticed that the quick (120), thready pulse at first present in some of the patients subsequently gave place to a slow, soft pulse (45 to 54). In some the difficulty in breathing was accompanied by fine crepitant sounds in the lungs, especially in the front of the chest, but there was no dulness on percussion. The expectoration was in some cases yellowish, and in the more severe it was mixed with blood, or was rust-coloured. Two of the men complained of pain in the throat and larynx, although there was no abnormal redness of the mucous membrane. In none of the cases was there any tendency to bronchitis, nor was there any notable elevation of temperature. Albumin was present in the urine in three of the patients. Recovery took place, in all but the two already mentioned, in nine or ten days.

JAMIESON (J.) "A case of lead poisoning from the use of soda water."—*Intercolonial Medical Journal of Australasia*, 1898.

THE patient, a medical man, had through the summer been drinking freely of soda water at the rate of about three pints daily. The soda water was home made, in an ordinary seltzogene, and on chemical examination it yielded a considerable amount of lead. No very definite symptoms of plumbism were observed in this case; there was no colic

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nor paralysis, the only significant sign being a number of minute, stellate, bluish patches on the gums. Dr. Jamieson properly advises that soda water should not be allowed to remain very long in the seltzogene, and that, before drinking any of it, an amount equal to the capacity of the lead tube and fittings should be drawn off and poured away, especially if a prolonged interval has elapsed since the previous supply was withdrawn.

CROOKE (G.) "Fatal case of acute poisoning by lead contained in diachylon."—*The Lancet*, 1898.

A WOMAN, twenty-three years of age, took emplastrum plumbi (diachylon) in the form of pills for some weeks, with the object of procuring abortion, which took place more than a week before she came under observation. When seen she was maniacally delirious, and had paroxysmal seizures in which she struggled violently. The breath was exceedingly offensive, the tongue was dry and coated, and a slaty-blue line was on the margins of the gums. The paroxysmal attacks seemed due to colic, and the bowels were cleared out by an enema. The patient became comatose and was convulsed; she was blind and the discs were choked. The urine contained albumin, casts, blood discs, epithelium, and leucocytes. The temperature was elevated, especially before death (105·4° F.), which took place two days after the patient was first seen.

Necropsy.—The membranes of the brain were opaque and thickened in parts, and the vessels were gorged with blood, the arteries being thrombosed with firmly adherent, fibrinous clots; ecchymoses were present in the pia. On microscopic examination the walls of the vessels were seen to be dotted over with numerous oil-droplets and albuminoid granules. The lumen of some of the blood vessels was irregular, being dilated in places in a fusiform manner of an aneurismal type. There were evidences of fatty infiltration of the viscera with ecchymoses in the gastric mucous membrane, and indications of gastro-enteritis. The kidneys were enlarged, soft, and flaccid, and showed well-marked parenchymatous nephritis. The uterus was about the size of a large pear, and presented all the appearance of a recent abortion, but was otherwise healthy.

"Expert testimony."—*The Philadelphia Polyclinic*, 1898.

DR. CHAPIN and Mr. Dallas Sanders, of the Philadelphia Bar, read papers on expert testimony before the Philadelphia County Medical Society, a discussion subsequently taking place.

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Dr. Chapin deals exclusively with the medico-legal aspect of insanity in relation to expert testimony. Among the hindrances to the formation of an opinion in insanity cases he instances the difficulty in obtaining a complete medical history of a case. The parties interested withhold information or misrepresent actions, so as to mislead the judgment of the physician, and the accused person often has the strongest incentives to simulate insanity. Dr. Chapin deprecates the practice of calling medical witnesses for the prosecution and for the defence to testify in trials involving questions of sanity or insanity, and attributes much of the depreciation of the value of evidence of this character to such modes of procedure. The witnesses often follow the lead of their respective counsel, and express exactly opposite opinions, or pledge themselves to statements of an extraordinary character, such as that a person who discharged a revolver five times as quickly as the trigger could be pulled had time enough between the second and third shots to have an epileptic seizure, and consequently to be irresponsible, and at the third shot to recover consciousness and to be responsible, the second shot being supposed to have done the fatal work. This evidence has been given by an expert in a court of law. The old question as to the obligation of expert witnesses to give evidence on subpœna against their inclinations is, according to Dr. Chapin, just as debatable in the United States as in England. He accordingly suggests that some one should decline to attend, when the required information would be afforded through the medium of a judicial decision. Dr. Chapin thinks that when lawyers and doctors are more generally agreed about the nature of insanity and other scientific questions, and when the former abandon some of their incongruous hypothetical questions, the present friction about this subject will disappear, and expert testimony will be elevated to a higher and more useful position.

Mr. Sanders deals with the subject from the legal standpoint, and relates some curious experiences of the law courts. Some of them seem to indicate that the higher the court the higher is the regard for medical men. For instance, a man who had been treated in hospital for an injury, brought an action against one of the doctors for alleged improper treatment; the case was tried three times. At the first trial a verdict was given against the doctor, with damages amounting to 5,512,050 dollars; the second time the jury disagreed; the third resulted in damages against the doctor for 12,000 dollars, which the court reduced to 4,000; and, finally, on appeal to the supreme court, the verdict was reversed and further proceedings were stayed, the judge of the court, when delivering judgment, paying a handsome compliment to the medical profession. Mr. Sanders thinks that medical experts are inclined to testify that a possibility is a probability, and deprecates the use of

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technical terms in the witness box, very properly observing that every member of the jury, whether he be a bricklayer, a coachman or a professor in a college, should be spoken to in plain English, so that he may understand the purport of the evidence given. Mr. Sanders states that according to the Act of 1895 a physician cannot be compelled to testify as an expert. This seems to have escaped the observation of Dr. Chapin, and is a pronouncement that would be welcome in this country. By the same Act a medical man, giving evidence in a civil case, is not allowed (without his patient's consent) to disclose any information acquired in a professional capacity which would tend to lower the character of his patient. In the United States expert evidence is coming more and more into use, and has much greater weight than formerly; the members of the profession, therefore, should be duly impressed with their grave responsibilities as expert witnesses.

In the discussion which followed, Dr. Wood held that the position of expert witnesses would be improved if they were required to limit their evidence to the subjects with which they were conversant, inasmuch as the jurymen had neither the education nor the mental capacity to estimate for themselves the value of the opinions expressed, but were prone to be influenced by appeals to their feelings or prejudices. He illustrated this by telling how an astute counsel, when defending a beautiful murderess, contrived to select a jury of young men, and asked them if they were willing "to blot out the greatest work of God's creation for the sake of a miserable speck of arsenic"? And they said, "D——d if we will blot it out." Dr. Burr held that the failings of expert witnesses were ignorance and dishonesty; there are a few physicians who tell lies in court, and some so ignorant as to be absolutely incompetent. He pithily adds that the expert's manner often counts more than his matter, and advocates greater strictness on the part of the judges in deciding as to the claims of an expert.

J. Dixon Mann.

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Reviews.

"Surgical Technics in Hospital Practice." By K. W. Monsarrat, M.B., F.R.C.S.E. Bristol: John Wright and Co. 1898.

In this little work, which is intended as a handbook for house-surgeons, students, and dressers, the author—as he explains in the preface—has attempted to systematise the routine duties of surgical hospital practice, and the general plan adopted has been to discuss in order the duties to the patient from the beginning to the end of his course of treatment.

He commences by directing attention to the importance of personal asepsis, and a chapter is then devoted to the preparation of patients for operation and to their management afterwards, directions being given for the treatment of shock, sickness, pain, restlessness, and delirium tremens. The preparation and arrangement of the theatre and the ordinary management of an operation are described, and, under the heading of "Special Cases," certain operations which require a special course of treatment are then considered, viz., operations on the brain, mouth and pharynx, and rectum, tracheotomy, empyema, abdominal section, intestinal obstruction, suprapubic cystotomy, lithotomy, and hysterectomy. After describing the arrangements of the wards, the various dressings and antiseptics in ordinary use, and the method of dressing a wound, etc., the work concludes with an appendix containing "Surgical Rules for Nurses," in which the author briefly summarises their duties and the points of importance to which they should specially pay attention in carrying them out.

The work is clearly and concisely written, and it contains in a small compass a large amount of valuable and practical information. While it will prove a very useful guide for the class for whom it is primarily intended, it may also be studied with profit by all those who, in the discharge of their practice, are called upon to deal with surgical cases.

"Elements of Histology." By E. Klein and J. S. Edkins. London: Cassell and Co. Ltd. 1898.

This work is now fifteen years old. It appeared first in 1883, was reprinted five times by 1887, a new edition appeared in 1889, which was reprinted five times up to 1895, and now we have the "new and enlarged

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edition" of 1898. We gladly welcome the new coadjutor and joint editor with Dr. Klein, viz., J. S. Edkins, who was formerly Demonstrator of Physiology in Owens College. Dr. Edkins has had charge of the chapters dealing with the brain,medulla and alimentary canal.

The work contains 296 illustrations, many of the new ones being micro-photographs.

A student usually finds difficulty in understanding the development of blood corpuscles, so that perhaps the short chapter on this subject might, we think, have been extended with advantage. A figure of bone marrow would have been useful. The low power view (photographed by Mr. Pringle) of epiphysial cartilage (p. 79) is excellent.

The structure of striped muscle is always a "quæstio vexata," and for the first time we believe, in an English text book, we have figures illustrating Professor Rutherford's views on this subject.

In the chapter on peripheral nerve-endings the expression "Doyère's nerve mount" (p. 165) seems rather peculiar. "Eminence" might meet the case.

In the chapters on the central nervous system, many of the illustrations are given as reproduced from Kölliker. Perhaps the task of giving a succinct account of the central nervous system within a comparatively limited number of pages, is one of the most difficult problems in descriptive histology.

The nasal mucous membrane is (relatively) fully dealt with, the organ of Jacobson being illustrated by three photographs.

At present the "ductless glands" perhaps, from a physiological point of view excite more interest than from a histological one (five pages, two illustrations). Perhaps Eberth's figure of a V.S., of supra-renal capsule might have been supplemented.

To compress the "elements of histology" into a small work of 500pp., with nearly 300 illustrations, is in itself a feat. The student of medicine will find these well-known "elements" a most useful guide, at once terse and not too verbose.

"Health Loss and Gain." By M. A. Chreiman. Rebman Publishing Co., Ltd. No. 1. 1898. 3s. nett.

It is indeed difficult to understand why this book of over two hundred pages should have been written. Even with the preface to guide one—and in that preface there is one sentence which occupies an entire page—its aim is not very clear. It seems to be addressed to medical men generally, and constitutes "a plea for the more definite and extended

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practice of preventive medicine," but the author attaches his own meaning to the term preventive medicine. It is a curious medley of protest, apology, explanation, and prayer, prevention and its cost, verities and credulities, respiration, confirmation, queries, results of preventive medicine, a few items of personal experience, and lastly, Church and State. To take only two of these items, the author thinks that if members of the profession of medicine did but promote, and practically enforce, the truths connected with one function, *respiration*, their work would be a priceless boon. Coming to "the items of personal experience," Mr. Chreiman, it appears, has cases sent to him for "lung exercises." Amongst the items of personal experience, we have a record of remarkable results achieved by the author. We utterly fail to see what interest this work can have for medical men.

"Physiology, Experimental and Descriptive." By BUEL P. COLTON. London: The Scientific Press, Ltd.

THIS is an interesting little work of over 400 pages, containing numerous illustrations, some coloured. The author is Professor of Natural Science in the Illinois State Normal University. The manuscript has been read by nearly a dozen teachers of physiology in the States. Scattered throughout the several chapters are descriptions of practical work which the pupil can readily undertake. The work is pleasantly written, the statements are definite, the illustrations numerous and good. Some of the old familiar words seem not quite themselves with American spelling, *e.g.*, "hemoglobin," "esophagus," "ameba," "fosforus," etc. In speaking of the sounds of the heart, the author puts them down 1 and 2, but what is called the "first sound" in English books, comes as 2. There are some good practical details that pupils can examine in their own bodies, given under the heading, "External indications of the circulation of the blood in the human body." A considerable number of "experiments" are described in connection with respiration, while there are additional chapters on the hygiene of respiration, heating and ventilation, which give these chapters a very practical bearing.

The author deals with the vexed question of alcohol, and boldly states that "alcohol is not a food." This statement is open to doubt. He states that there is only one safe rule with regard to it: "Touch not, taste not, handle not." Then follow several excerpts from the writings of various authors on alcohol, and the subject is referred to again later on.

We hardly think it accurate to represent valves in a lacteal *within* a a villus (Fig. 67).

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To each chapter there is an appendix dealing with the practical applications of the purely physiological facts. The later chapters deal with "Accidents: What to do till the doctor comes"; "Food and Cooking"; "Antiseptics and Disinfectants"; "Tables of Statistics"; and, last of all, a useful "Glossary." In the last, each word has in brackets "a phonetic representation of its pronunciation." Perhaps the derivation of the words would have been useful.

The work is pleasantly written, and every now and again one comes across a pithy phrase, *e.g.*, "Many a man spends enough on tobacco to send a boy through college," "Sight is priceless," "Nothing sustains like hope." To many of the chapters is appended a list of works for "reading." This book ought to prove very valuable to those who intend to teach physiology in schools.

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GENERAL INDEX.

LIST OF SUBJECTS.

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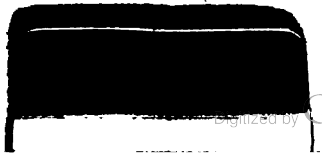

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